CE

SPORTON LAB.

Certificate No: ER232843-05AC

# CERTIFICATE OF COMPLIANCE

**EQUIPMENT : 802.11abgn, USB module**
**MODEL NO. : WUBR-508N**
**APPLICANT : SparkLAN Communications, Inc.**
8F., No.257, Sec. 2, Tiding Blvd.,
Neihu District, Taipei City 11493, Taiwan

SPORTON LAB.

**I HEREBY CERTIFY THAT:**

The following technical requirements and test specifications are relevant to the presumption of conformity under article **3.2** of the **R&TTE Directive 1999/5/EC**
The equipment was **Passed** the test performed according to
**ETSI EN 300 328 V1.8.1 (2012-06)**
The test was carried out on **Sep. 25, 2014** SPORTON INTERNATIONAL INC. LAB.

**Vic Hsiao / Supervisor**

# CE Test Report

| | | |
|---|---|---|
| **Equipment** | **:** | **802.11abgn, USB module** |
| **Brand Name** | **:** | **SparkLAN** |
| **Model No.** | **:** | **WUBR-508N** |
| **Standard** | **:** | **EN 300 328 V1.8.1 (2012-06)** |
| **Operating Band** | **:** | **2400 MHz – 2483.5 MHz** |
| **Applicant**<br>**Manufacturer** | **:** | **SparkLAN Communications, Inc.**<br>8F., No.257, Sec. 2, Tiding Blvd.,<br>Neihu District, Taipei City 11493, Taiwan |

**The product sample received on Sep. 04, 2014 and completely tested on Sep. 25, 2014. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in EN 300 328 V1.8.1 (2012-06) and shown compliance with the applicable technical standards. The equipment under R&TTE Directive 1999/5/EC of article 3.2 harmonized essential for the radio spectrum requirements.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.**

**Reviewed by:**

Vic Hsiao / Supervisor

Testing Laboratory
1190

# Table of Contents

# Summary of Test Result

| Harmonized Standard Requirements and Conformance Test Specifications | | | | | |
|---|---|---|---|---|---|
| **Report Clause** | **Ref. Std. Clause** | **Description** | **Measured** | **Limit** | **Result** |
| 3.1 | 4.3.2.1 | RF Output Power | EIRP [dBm]: 19.91 | 20 dBm | Complied |
| 3.2 | 4.3.2.2 | Power Density | EIRP PSD [dBm/MHz] 9.43 | 10 dBm/MHz | Complied |
| - | 4.3.2.3 | Duty cycle, Tx-Sequence, Tx-gap | Adaptive w/o test | EN 300 328 Clause 4.3.2.3.2 | N/A |
| - | 4.3.2.4 | Medium Utilisation | Adaptive w/o test | MU > 10% | N/A |
| 3.3 | 4.3.2.6 | Occupied Channel Bandwidth | OCB fall in band Bandwidth [MHz] 20M:17.82 40M:36.56 | Fall in band | Complied |
| 3.4 | 4.3.2.7 | Transmitter unwanted emissions in the OOB domain | 2484.0 MHz -27.38 dBm (Margin 17.38 dB) | EN 300 328 Figure 3 | Complied |
| 3.5 | 4.3.2.8 | Transmitter unwanted emissions in the spurious domain | [e.i.r.p.]: 833.16 MHz -64.89 dBm (Margin 10.89 dB) | EN 300 328 Table 4 | Complied |
| 4.1 | 4.3.2.9 | Receiver spurious emissions | [e.i.r.p.]: 960.23 MHz -60.25 dBm (Margin 3.25 dB) | EN 300 328 Table 5 | Complied |
| 5.1 | 4.3.2.5 | Adaptivity | COT: 1.34 ms Idle: 1.21 ms | IEEE 802.11 IEEE 802.11n | Complied |
| | 4.3.2.10 | Receiver Blocking | COT: 1.34 ms Idle: 1.16 ms | IEEE 802.11 IEEE 802.11n | Complied |

# Revision History

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| ER232843AC | Rev. 01 | Initial issue of report | May 15, 2012 |
| ER232843-05AC | Rev. 01 | Update Standard to EN 300 328 V1.8.1 (2012-06) | Nov. 13, 2014 |
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# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| RF General Information | | | | | |
|---|---|---|---|---|---|
| **Frequency Range (MHz)** | **IEEE Std. 802.11** | **Ch. Frequency (MHz)** | **Channel Number** | **Transmit Chains ($N_{TX}$)** | **EIRP - Output Power (dBm)** |
| 2400-2483.5 | b | 2412-2472 | 1-13 [13] | 1 | 19.74 |
| 2400-2483.5 | g | 2412-2472 | 1-13 [13] | 1 | 19.91 |
| 2400-2483.5 | n (HT20) | 2412-2472 | 1-13 [13] | 2 | 19.80 |
| 2400-2483.5 | n (HT40) | 2422-2462 | 3-11 [9] | 2 | 19.89 |
| Note 1: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.<br>Note 2: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. | | | | | |

### 1.1.2 Antenna Information

| Antenna Category | |
|---|---|
| ☒ | Integral antenna (antenna permanently attached) |
| | ☐ Temporary RF connector provided |
| | ☒ No temporary RF connector provided<br>Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |

| Antenna General Information | | | |
|---|---|---|---|
| **No.** | **Ant. Cat.** | **Ant. Type** | **Gain (dBi)** |
| 1 | Integral | Printed | 3.79 |

Remark:
1. In modulation mode 11b and 11g, this EUT supports diversity. EUT was pre-tested Antenna Port 1 and Antenna Port 2 for single chain, and the worst case was Antenna Port 2. Therefore only the test data (Port 2) was recorded in this report.
2. In modulation mode 11n, this EUT supports 2TX.

### 1.1.3 Type of EUT

| Identify EUT | |
|---|---|
| EUT Serial Number | N/A |
| Presentation of Equipment | ☒ Production ; ☐ Pre-Production ; ☐ Prototype |

| Type of EUT | |
|---|---|
| ☒ | Stand-alone |
| ☐ | Combined (EUT where the radio part is fully integrated within another device)<br>Combined Equipment - Brand Name / Model No.: … |
| ☐ | Plug-in radio (EUT intended for a variety of host systems)<br>Host System - Brand Name / Model No.: … |
| ☐ | Other: |

### 1.1.4 Test Signal Duty Cycle

| Operated Mode for Worst Duty Cycle | |
|---|---|
| ☐ Operated normally mode for worst duty cycle | |
| ☒ Operated test mode for worst duty cycle | |
| **Test Signal Duty Cycle (x)** | **Power Duty Factor [dB] – (10 log 1/x)** |
| ☒ 100.00% - IEEE 802.11b | 0.00 |
| ☒ 100.00% - IEEE 802.11g | 0.00 |
| ☒ 100.00% - IEEE 802.11n (HT20) | 0.00 |
| ☒ 100.00% - IEEE 802.11n (HT40) | 0.00 |

### 1.1.5 Medium Access Protocol

| Medium Access Protocol | | |
|---|---|---|
| Medium Access Protocol: | ☒ | IEEE Std. 802.11-2007 |
| | ☒ | IEEE Std. 802.11n-2009 |
| | ☐ | IEEE Std. 802.15.4-2006 |
| | ☐ | IEEE Std. 802.15.1-2005 |
| | ☐ | Other: |
| A medium access protocol has been implemented by the equipment. With mechanism designed to facilitate spectrum sharing with other devices in a wireless network. The equipment implements an adequate spectrum sharing mechanism and users will be equal access wireless network. | | |

### 1.1.6 EUT Operational Condition

| | | | |
|---|---|---|---|
| **Supply Voltage** | ☐ AC mains | ☒ DC | |
| **Type of DC Source** | ☐ Internal DC supply | ☒ From system | ☐ External DC adapter |
| **Test Voltage** | ☒ Vnom (5 V) | ☒ Vmax (5.25 V) | ☒ Vmin (4.75 V) |
| **Test Climatic** | ☒ Tnom (20°C) | ☒ Tmax (50°C) | ☒ Tmin (0°C) |

### 1.1.7 Adaptive Equipment

| **Adaptive Equipment** | | |
|---|---|---|
| ☐ | non-Adaptive Equipment: | |
| | The maximum RF Output Power (e.i.r.p.): … dBm | |
| | The maximum (corresponding) Duty Cycle: … % | |
| ☒ | Adaptive Equipment without the possibility to switch to a non-adaptive mode: | |
| | ☒ | The equipment has implemented an LBT based DAA mechanism: |
| | | ☐ The equipment is Frame Based equipment |
| | | ☒ The equipment is Load Based equipment |
| | | ☐ The equipment can switch dynamically between Frame Based and Load Based equipment |
| | ☐ | The equipment has implemented an non-LBT based DAA mechanism |
| | ☐ | The equipment can operate in more than one adaptive mode |
| ☐ | Adaptive Equipment which can also operate in a non-adaptive mode | |

## 1.2 Support Equipment

| Support Equipment - RF Conducted | | | |
|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** |
| 1 | Notebook | DELL | E5540 |

| Support Equipment - Radiated Emission | | | |
|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** |
| 1 | Notebook | DELL | E5520 |

| Support Equipment – Adaptivity | | | |
|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** |
| 1 | AP (Master) | EDIMAX | EW-7679WAC |
| 2 | Notebook | DELL | E5510 |
| 3 | Notebook | DELL | E5530 |

## 1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- EN 300 328 V1.8.1 (2012-06)

## 1.4 Testing Location Information

| Testing Location | | | | | |
|---|---|---|---|---|---|
| ☒ | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973 | | | |
| **Test Condition** | | **Test Site No.** | **Test Engineer** | **Test Environment** | |
| RF Conducted | | TH01-HY | Cain | 22.8°C / 62% | |
| Radiated Emission | | 05CH01-HY | Thor | 23°C / 62% | |
| Adaptivity Site | | DFS01-HY | Shiming | 26.5°C / 60.7% | |

## 1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

| Measurement Uncertainty | | | |
|---|---|---|---|
| **Test Item** | | **Uncertainty** | **Limit** |
| Radio Frequency | | ± 8.7 X $10^{-7}$ | ± 1 X $10^{-5}$ |
| RF output power, conducted | | ±0.6 dB | ±1.5 dB |
| Power density, conducted | | ±1.2 dB | ±3 dB |
| Unwanted emissions, conducted | 30 – 1000 MHz | ±0.5 dB | ±3 dB |
| | 1 – 12.75 GHz | ±0.7 dB | ±3 dB |
| All emissions, radiated | 30 – 1000 MHz | ±2.3 dB | ±6 dB |
| | 1 – 12.75 GHz | ±2.6 dB | ±6 dB |
| Temperature | | ±0.8 °C | ±1 °C |
| Humidity | | ±3 % | ±5 % |
| DC and low frequency voltages | | ±3 % | ±3 % |

# 2 Test Configuration of EUT

## 2.1 The Worse Case Modulation Configuration

| Worst Modulation Used for Conformance Testing | | | |
|---|---|---|---|
| **Modulation Mode** | **Transmit Chains ($N_{TX}$)** | **Data Rate / MCS** | **Worst Data Rate / MCS** |
| 11b | 1 | 1-11 Mbps | 1 Mbps |
| 11g | 1 | 6-54 Mbps | 6 Mbps |
| HT20 | 2 | MCS 8-15 | MCS 8 |
| HT40 | 2 | MCS 8-15 | MCS 8 |

## 2.2 Test Channel Frequencies Configuration

| Test Channel Frequencies Configuration | |
|---|---|
| **IEEE Std. 802.11** | **Test Channel Frequencies (MHz)** |
| b, g, n (HT20)<br>n (HT40) | 2412-(F1), 2442-(F2), 2472-(F3)<br>2422-(F4), 2437-(F5), 2462-(F6) |

## 2.3 The Worse Case Power Setting Parameter

| The Worst Case Power Setting Parameter (2400-2483.5MHz band) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Test Software/Version** | RT5x7x QA V1.0.5.9_V1.0.5.9 | | | | | | |
| **Modulation Mode** | **$N_{TX}$** | **Test Frequency (MHz)** | | | | | |
| | | **NCB: 20MHz** | | | **NCB: 40MHz** | | |
| | | **2412** | **2442** | **2472** | **2422** | **2437** | **2462** |
| 11b,1-11Mbps | 1 | 09 | 0A | 0B | - | - | - |
| 11g,6-54Mbps | 1 | 0F | 0F | 11 | - | - | - |
| HT20,M8-15 | 2 | 12,0B | 11,0B | 11,0C | - | - | - |
| HT40,M8-15 | 2 | - | - | - | 12,0B | 11,0C | 12,0C |

## 2.4 The Worst Case Measurement Configuration

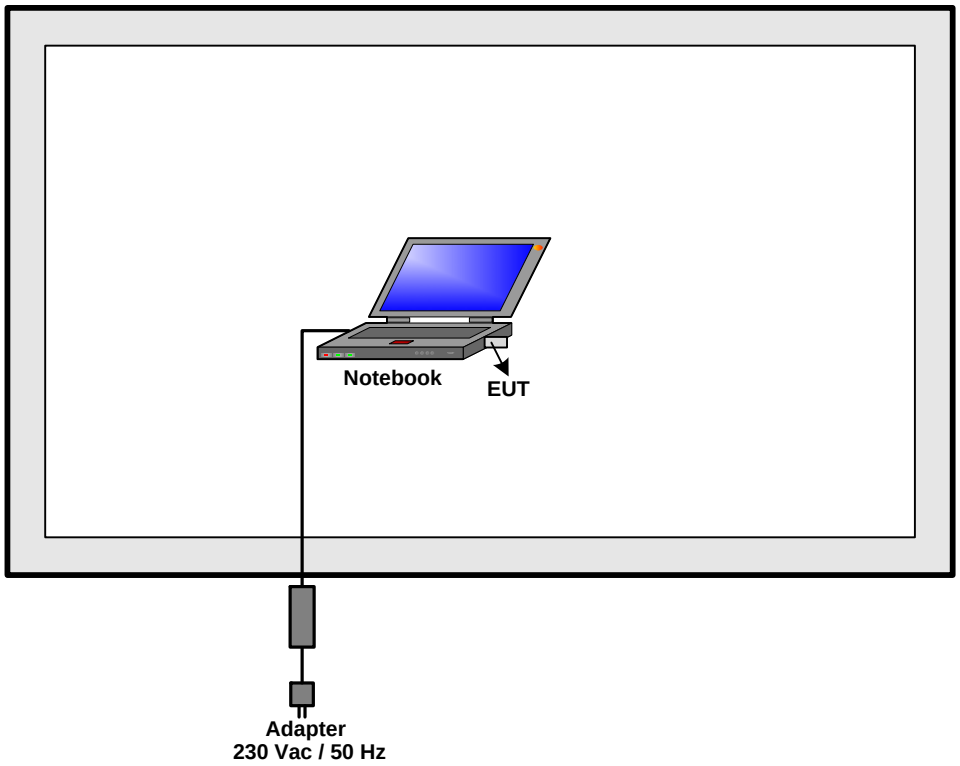
| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | RF Output Power, Power Density, Occupied Channel Bandwidth<br>Transmitter unwanted emissions in the OOB domain |
| **Test Condition** | Conducted measurement at transmit chains |
| **Modulation Mode** | 11b, 11g, HT20, HT40 |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Transmitter Unwanted Emissions in The Spurious Domain,<br>Receiver Spurious Emissions |
| **Test Condition** | Radiated measurement<br>If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. |
| **User Position** | ☐ EUT will be placed in fixed position. |
| | ☒ EUT will be placed in mobile position and operating multiple positions. The worst planes is X. |
| | ☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes. |
| **Operating Mode** | Operating Mode Description |
| 1 | Transmit / Receive |
| **Modulation Mode** | 11b, 11g, HT20, HT40 |
| **Orthogonal Planes of EUT** | **X Plane** |
| |  |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Adaptivity & Receiver Blocking |
| **Test Condition** | Conducted measurement at transmit chains |
| **Modulation Mode** | 11b, 11g, HT20, HT40 |

## 2.5 Test Setup Diagram

**Test Setup Diagram - Radiated Test**



# 3 Transmitter Test Result

## 3.1 RF Output Power

### 3.1.1 RF Output Power Limit

| RF Output Power Limit |
|---|
| **Type of Equipment Using Wide Band Modulations Other than FHSS:** |
| ☒ mean equivalent isotropic radiated power (e.i.r.p.) ≤ 20 dBm |

### 3.1.2 Measuring Instruments

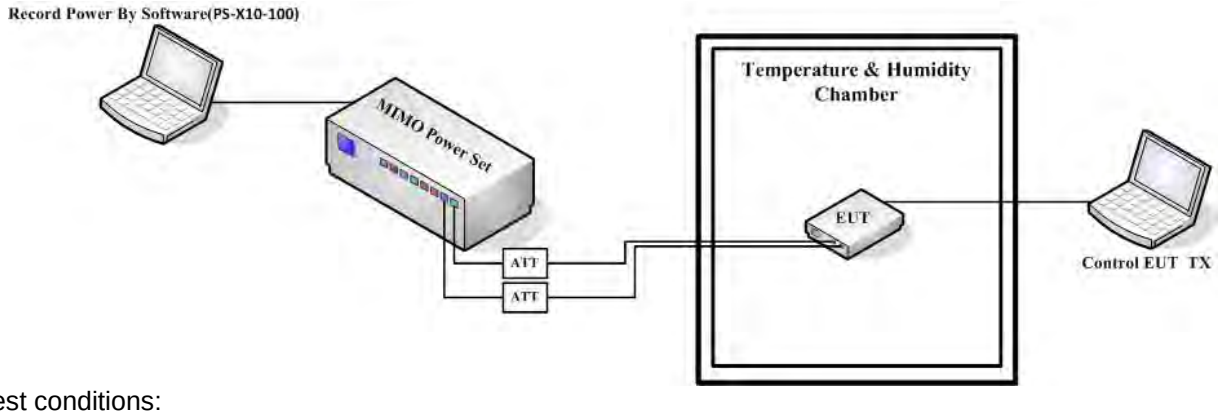
Refer a test equipment and calibration data table in this test report.

### 3.1.3 Test Procedures

| Test Method | |
|---|---|
| ☒ | The measurements shall be performed at both normal environmental conditions and at the extremes of the operating temperature range. |
| ☒ | Refer as EN 300 328, clause 5.3.2.2.1 for conducted measurement. |
| Step 1: | Use a fast power sensor suitable for 2,4 GHz and capable of 1 MS/s.<br>Use the following settings:<br>- Sample speed 1 MS/s or faster.<br>- The samples must represent the power of the signal.<br>- Measurement duration: For adaptive equipment, the measurement duration shall be long enough to ensure a minimum number of bursts (at least 10) are captured.<br>NOTE 1: For adaptive equipment, to increase the measurement accuracy, a higher number of bursts may be used. |
| Step 2: | For conducted measurements on devices with multiple transmit chains:<br>- Connect one power sensor to each transmit port for a synchronous measurement on all transmit ports.<br>- Trigger the power sensors so that they start sampling at the same time.<br>Make sure the time difference between the samples of all sensors is less than half the time between two samples.<br>- For each instant in time, sum the power of the individual samples of all ports and store them.<br>Use these stored samples in all following steps. |
| Step 3: | Find the start and stop times of each burst in the stored measurement samples.<br>NOTE 2: The start and stop times are defined as the points where the power is at least 20 dB the RMS burst power calculated in step 4. |
| Step 4: | Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these Pburst values, as well as the start and stop times for each burst. |
| Step 5: | The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations. |
| Step 6: | Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.<br>If applicable, add the additional beamforming gain "Y" in dB.<br>If more than one antenna assembly is intended for this power setting, the maximum overall antenna gain (G or G + Y) shall be used. The RF Output Power (P) shall be calculated using the formula below:<br>P = A + G + YThis value, which shall comply with the limit given in clauses 4.3.2.1.2, shall be recorded in the test report. |
| ☐ | Refer as EN 300 328, clause 5.3.2.2.2 for radiated measurement. |

### 3.1.4 Test Setup

**RF Output Power**




Test conditions:
The measurements for RF output power shall be performed at both normal environmental conditions and at the extremes of the operating temperature range.

### 3.1.5 Maximum Antenna Gain

| Maximum Antenna Gain Result | | | |
|---|---|---|---|
| **Transmit Chains No.** | | 1 | 2 |
| **Maximum Gain (dBi)-G** | | 3.79 | 3.79 |
| **Modulation Mode** | **G (dBi)** | **$N_{TX}$** | **$N_{SS}$ (Min.)** |
| 11b,1-11Mbps | 3.79 | 1 | 1 |
| 11g,6-54Mbps | 3.79 | 1 | 1 |
| HT20,M8-15 | 3.79 | 2 | 2 |
| HT40,M8-15 | 3.79 | 2 | 2 |

### 3.1.6 Test Result of RF Output Power

| Test Date: Sep. 22, 2014 | | RF Output Power Result | | | | |
|---|---|---|---|---|---|---|
| Max. Gain (dBi) | | 3.79 | | RF Output Power (dBm) | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | Port 2 (dBm) | EIRP Power (dBm) | EIRP Limit (dBm) |
| TnomVnom | 11b | 1 | 2412 | 14.97 | 18.76 | 20 |
| TminVmax | 11b | 1 | 2412 | 15.87 | 19.66 | 20 |
| TminVmin | 11b | 1 | 2412 | 15.90 | 19.69 | 20 |
| TmaxVmax | 11b | 1 | 2412 | 12.94 | 16.73 | 20 |
| TmaxVmin | 11b | 1 | 2412 | 12.94 | 16.73 | 20 |
| TnomVnom | 11b | 1 | 2442 | 15.04 | 18.83 | 20 |
| TminVmax | 11b | 1 | 2442 | 15.95 | 19.74 | 20 |
| TminVmin | 11b | 1 | 2442 | 15.91 | 19.70 | 20 |
| TmaxVmax | 11b | 1 | 2442 | 12.87 | 16.66 | 20 |
| TmaxVmin | 11b | 1 | 2442 | 12.87 | 16.66 | 20 |
| TnomVnom | 11b | 1 | 2472 | 14.70 | 18.49 | 20 |
| TminVmax | 11b | 1 | 2472 | 15.71 | 19.50 | 20 |
| TminVmin | 11b | 1 | 2472 | 15.72 | 19.51 | 20 |
| TmaxVmax | 11b | 1 | 2472 | 12.50 | 16.29 | 20 |
| TmaxVmin | 11b | 1 | 2472 | 12.51 | 16.30 | 20 |
| Result | | | | Complied | | |

| Test Date: Sep. 22, 2014 | | RF Output Power Result | | | | |
|---|---|---|---|---|---|---|
| Max. Gain (dBi) | | 3.79 | | RF Output Power (dBm) | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | Port 2 (dBm) | EIRP Power (dBm) | EIRP Limit (dBm) |
| TnomVnom | 11g | 1 | 2412 | 14.59 | 18.38 | 20 |
| TminVmax | 11g | 1 | 2412 | 15.95 | 19.74 | 20 |
| TminVmin | 11g | 1 | 2412 | 15.91 | 19.70 | 20 |
| TmaxVmax | 11g | 1 | 2412 | 12.44 | 16.23 | 20 |
| TmaxVmin | 11g | 1 | 2412 | 12.45 | 16.24 | 20 |
| TnomVnom | 11g | 1 | 2442 | 14.60 | 18.39 | 20 |
| TminVmax | 11g | 1 | 2442 | 15.86 | 19.65 | 20 |
| TminVmin | 11g | 1 | 2442 | 15.83 | 19.62 | 20 |
| TmaxVmax | 11g | 1 | 2442 | 12.37 | 16.16 | 20 |
| TmaxVmin | 11g | 1 | 2442 | 12.34 | 16.13 | 20 |
| TnomVnom | 11g | 1 | 2472 | 14.90 | 18.69 | 20 |
| TminVmax | 11g | 1 | 2472 | 16.12 | 19.91 | 20 |
| TminVmin | 11g | 1 | 2472 | 16.07 | 19.86 | 20 |
| TmaxVmax | 11g | 1 | 2472 | 12.63 | 16.42 | 20 |
| TmaxVmin | 11g | 1 | 2472 | 12.60 | 16.39 | 20 |
| Result | | | | Complied | | |

| Test Date: Sep. 22, 2014 | | RF Output Power Result | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Max. Gain (dBi) | | 3.79 | | RF Output Power (dBm) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | Port 1 (dBm) | Port 2 (dBm) | Sum (dBm) | EIRP Power (dBm) | EIRP Limit (dBm) |
| TnomVnom | HT20 | 2 | 2412 | 11.83 | 11.21 | 14.54 | 18.33 | 20 |
| TminVmax | HT20 | 2 | 2412 | 12.94 | 12.56 | 15.76 | 19.55 | 20 |
| TminVmin | HT20 | 2 | 2412 | 12.91 | 12.50 | 15.72 | 19.51 | 20 |
| TmaxVmax | HT20 | 2 | 2412 | 9.92 | 8.97 | 12.48 | 16.27 | 20 |
| TmaxVmin | HT20 | 2 | 2412 | 9.85 | 8.89 | 12.41 | 16.20 | 20 |
| TnomVnom | HT20 | 2 | 2442 | 11.76 | 11.18 | 14.49 | 18.28 | 20 |
| TminVmax | HT20 | 2 | 2442 | 13.02 | 12.66 | 15.85 | 19.64 | 20 |
| TminVmin | HT20 | 2 | 2442 | 12.97 | 12.62 | 15.81 | 19.60 | 20 |
| TmaxVmax | HT20 | 2 | 2442 | 9.48 | 8.55 | 12.05 | 15.84 | 20 |
| TmaxVmin | HT20 | 2 | 2442 | 9.52 | 8.58 | 12.09 | 15.88 | 20 |
| TnomVnom | HT20 | 2 | 2472 | 11.82 | 11.61 | 14.73 | 18.52 | 20 |
| TminVmax | HT20 | 2 | 2472 | 13.00 | 12.99 | 16.01 | 19.80 | 20 |
| TminVmin | HT20 | 2 | 2472 | 12.97 | 12.92 | 15.96 | 19.75 | 20 |
| TmaxVmax | HT20 | 2 | 2472 | 9.50 | 9.07 | 12.30 | 16.09 | 20 |
| TmaxVmin | HT20 | 2 | 2472 | 9.48 | 8.98 | 12.25 | 16.04 | 20 |
| Result | | | | Complied | | | | |

| Test Date: Sep. 22, 2014 | | RF Output Power Result | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Max. Gain (dBi) | | 3.79 | | RF Output Power (dBm) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | Port 1 (dBm) | Port 2 (dBm) | Sum (dBm) | EIRP Power (dBm) | EIRP Limit (dBm) |
| TnomVnom | HT40 | 2 | 2422 | 11.83 | 11.03 | 14.46 | 18.25 | 20 |
| TminVmax | HT40 | 2 | 2422 | 13.08 | 12.57 | 15.84 | 19.63 | 20 |
| TminVmin | HT40 | 2 | 2422 | 13.06 | 12.60 | 15.85 | 19.64 | 20 |
| TmaxVmax | HT40 | 2 | 2422 | 9.69 | 8.58 | 12.18 | 15.97 | 20 |
| TmaxVmin | HT40 | 2 | 2422 | 9.64 | 8.50 | 12.12 | 15.91 | 20 |
| TnomVnom | HT40 | 2 | 2437 | 11.97 | 11.55 | 14.78 | 18.57 | 20 |
| TminVmax | HT40 | 2 | 2437 | 13.30 | 12.71 | 16.03 | 19.82 | 20 |
| TminVmin | HT40 | 2 | 2437 | 13.28 | 12.67 | 16.00 | 19.79 | 20 |
| TmaxVmax | HT40 | 2 | 2437 | 9.38 | 9.49 | 12.45 | 16.24 | 20 |
| TmaxVmin | HT40 | 2 | 2437 | 9.47 | 9.53 | 12.51 | 16.30 | 20 |
| TnomVnom | HT40 | 2 | 2462 | 11.89 | 11.44 | 14.68 | 18.47 | 20 |
| TminVmax | HT40 | 2 | 2462 | 12.94 | 13.17 | 16.07 | 19.86 | 20 |
| TminVmin | HT40 | 2 | 2462 | 12.98 | 13.19 | 16.10 | 19.89 | 20 |
| TmaxVmax | HT40 | 2 | 2462 | 9.69 | 8.98 | 12.36 | 16.15 | 20 |
| TmaxVmin | HT40 | 2 | 2462 | 9.69 | 9.00 | 12.37 | 16.16 | 20 |
| Result | | | | Complied | | | | |

# 3.2 Power Density

## 3.2.1 Power Density Limit

| Power Density Limit |
|---|
| **Type of Equipment Using Wide Band Modulations Other than FHSS:** |
| ☒ mean equivalent isotropic radiated power (e.i.r.p.) density ≤ 10 dBm/MHz |

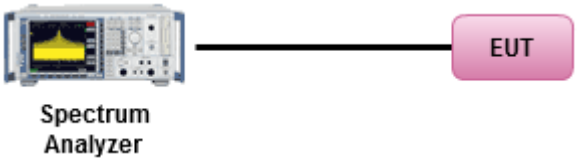
## 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.2.3 Test Procedures

| Test Method | |
|---|---|
| ☒ | Refer as EN 300 328, clause 5.3.3.2.1 for conducted measurement. |
| Step 1: | Connect the UUT to the spectrum analyzer and use the following settings:<br>- Start & Stop Frequency: 2400 MHz ~ 2483.5MHz<br>- Resolution BW: 10 kHz<br>- Video BW: 30 kHz<br>- Sweep Points: > 8 350<br>- Detector Mode: RMS<br>- Trace Mode: Max Hold<br>- Sweep time: Auto<br>- Note: For non-continuous signals, wait for the trace to be completed. Save the (trace) data set to a file. |
| Step 2: | For conducted measurements on smart antenna systems using either operating mode 2 or 3 (see clause 5.1.3.2), repeat the measurement for each of the transmit ports. For each frequency point, add up the amplitude (power) values for the different transmit chains and use this as the new data set. |
| Step 3: | Add up the values for amplitude (power) for all the samples in the file. |
| Step 4: | Normalize the individual values for amplitude so that the sum is equal to the RF Output Power (e.i.r.p.) measured in clause 5.3.2. |
| Step 5: | Starting from the first sample in the file (lowest frequency), add up the power of the following samples representing a 1 MHz segment and record the results for power and position (i.e. sample #1 to #100). This is the Power Density (e.i.r.p.) for the first 1 MHz segment which shall be recorded. |
| Step 6: | Shift the start point of the samples added up in step 3 by 1 sample and repeat the procedure in step 3 (i.e. sample #2 to #101). |
| Step 7: | Repeat step 4 until the end of the data set and record the radiated power density values for each of the 1 MHz segments.<br>From all the recorded results, the highest value is the maximum Power Density for the UUT. This value, which shall comply with the limit given in clause 4.3.2.2.2, shall be recorded in the test report. |
| ☐ | Refer as EN 300 328, clause 5.3.3.2.2 for radiated measurement. |

### 3.2.4 Test Setup

| Power Density |
|---|
|   Spectrum Analyzer |

### 3.2.5 Test Result of Power Density

| Test Date: Sep. 22, 2014 | | | Maximum e.i.r.p. Spectral Density Result | | | |
|---|---|---|---|---|---|---|
| Modulation Mode | $N_{TX}$ | Freq. (MHz) | PD (dBm/MHz) | Max. Gain (dBi) | EIRP PD (dBm/MHz) | EIRP Limit (dBm/MHz) |
| 11b | 1 | 2412 | 5.35 | 3.79 | 9.14 | 10 |
| 11b | 1 | 2442 | 5.64 | 3.79 | 9.43 | 10 |
| 11b | 1 | 2472 | 5.24 | 3.79 | 9.03 | 10 |
| 11g | 1 | 2412 | 3.13 | 3.79 | 6.92 | 10 |
| 11g | 1 | 2442 | 3.47 | 3.79 | 7.26 | 10 |
| 11g | 1 | 2472 | 3.73 | 3.79 | 7.52 | 10 |
| HT20 | 2 | 2412 | 2.86 | 3.79 | 6.65 | 10 |
| HT20 | 2 | 2442 | 2.88 | 3.79 | 6.67 | 10 |
| HT20 | 2 | 2472 | 3.05 | 3.79 | 6.84 | 10 |
| HT40 | 2 | 2422 | -0.21 | 3.79 | 3.58 | 10 |
| HT40 | 2 | 2437 | 0.12 | 3.79 | 3.91 | 10 |
| HT40 | 2 | 2462 | -0.11 | 3.79 | 3.68 | 10 |
| Result | | | Complied | | | |

# 3.3 Occupied Channel Bandwidth

## 3.3.1 Occupied Channel Bandwidth Limit

| Occupied Channel Bandwidth Limit |
|---|
| **Type of Frequency Hopping Equipment:** |
| ☐ Occupied Channel Bandwidth for each hopping frequency fall completely within 2.4 GHz – 2.4835 GHz. |
| ☐ For non-adaptive equipment with e.i.r.p greater than 10 dBm, Occupied Channel Bandwidth ≤ 5 MHz. |
| **Type of Equipment Using Wide Band Modulations Other than FHSS:** |
| ☒ Occupied Channel Bandwidth fall completely within 2.4 GHz – 2.4835 GHz. |
| ☐ For non-adaptive equipment with e.i.r.p greater than 10 dBm, Occupied Channel Bandwidth ≤ 20 MHz. |

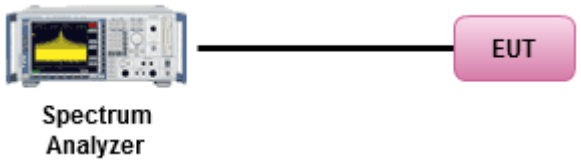
## 3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.3.3 Test Procedures

| Test Method | |
|---|---|
| ☒ | Refer as EN 300 328, clause 5.3.8.2.1 for conducted measurement. |
| | ☐ The EUT supports single transmit chain and measurements performed on this transmit chain 2. |
| | ☒ The EUT supports diversity transmitting and the results on transmit chain port 2 is the worst case. |
| | ☒ Refer as EN 300 328, clause 5.3.8.2.1 for conducted measurements on smart antenna systems (equipment with multiple transmit chains) measurements need only to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1. |
| ☐ | Refer as EN 300 328, clause 5.3.8.2.2clause 5.3.8.2.2 for radiated measurement. |

## 3.3.4 Test Setup

| Emission Bandwidth |
|---|
|  |

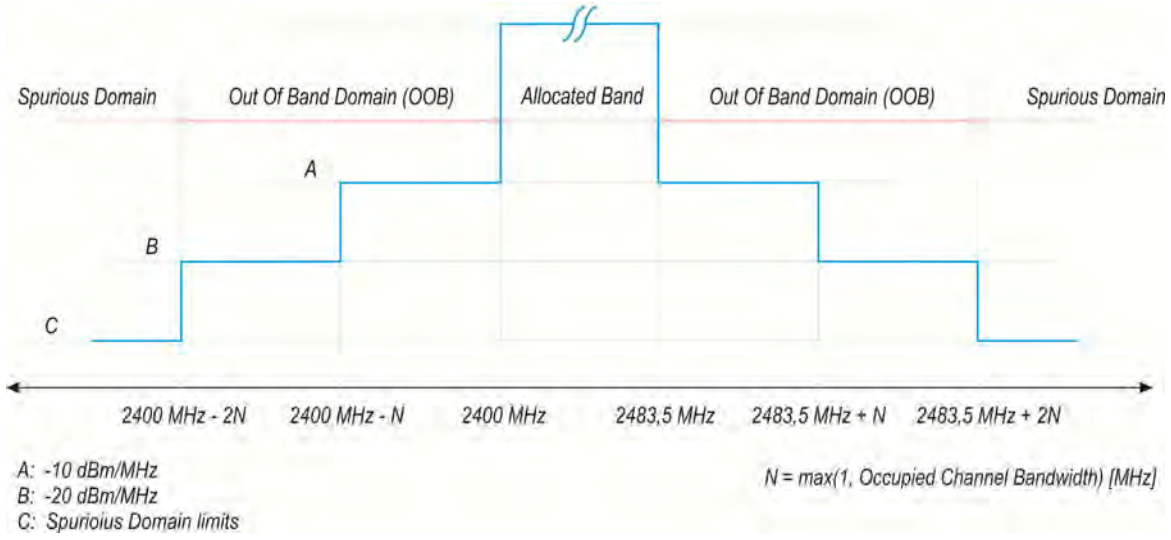
### 3.3.5 Test Result of Occupied Channel Bandwidth

| Test Date: Sep. 22, 2014 | | Occupied Channel Bandwidth Result | | | |
|---|---|---|---|---|---|
| Modulation Mode | Frequency (MHz) | 99% Bandwidth (MHz) | $F_L$ at 99% BW (MHz) | $F_H$ at 99% BW (MHz) | 6dB Bandwidth (MHz) |
| 11b | 2412 | 14.65 | 2404.68400 | 2419.33600 | 10.84 |
| 11b | 2472 | 14.67 | 2464.64400 | 2479.31600 | 10.84 |
| 11g | 2412 | 16.91 | 2403.56400 | 2420.47600 | 16.88 |
| 11g | 2472 | 16.91 | 2463.54400 | 2480.45600 | 16.88 |
| HT20 | 2412 | 17.89 | 2403.06400 | 2420.95600 | 17.82 |
| HT20 | 2472 | 17.89 | 2463.04400 | 2480.93600 | 17.82 |
| HT40 | 2422 | 36.10 | 2403.96900 | 2440.07100 | 36.56 |
| HT40 | 2462 | 36.10 | 2443.92900 | 2480.03100 | 36.52 |
| **Limit** | | **N/A** | **2400** | **2483.5** | **N/A** |
| **Result** | | **Complied** | | | |

# 3.4 Transmitter Unwanted Emissions in the Out-of-band Domain

## 3.4.1 Transmitter Unwanted Emissions in the Out-of-band Domain Limit

**Transmit Mask Limit**



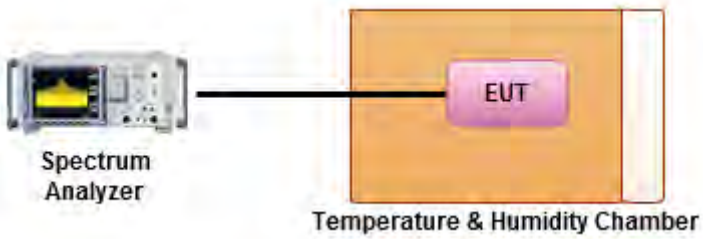

## 3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

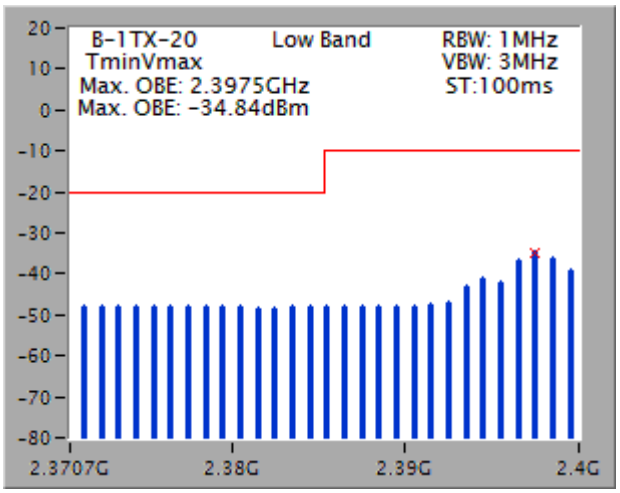
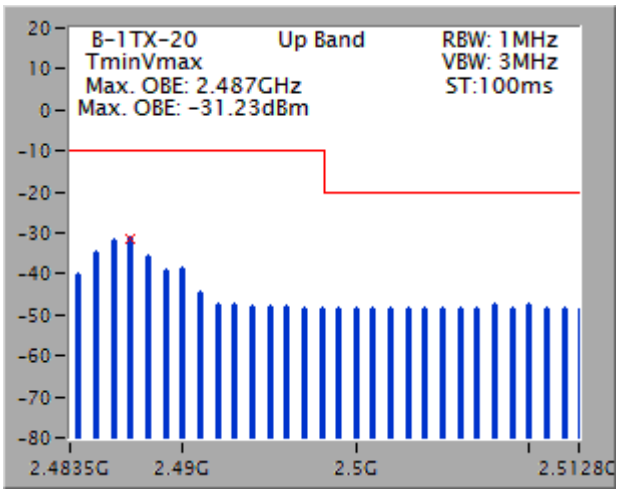
## 3.4.3 Test Procedures

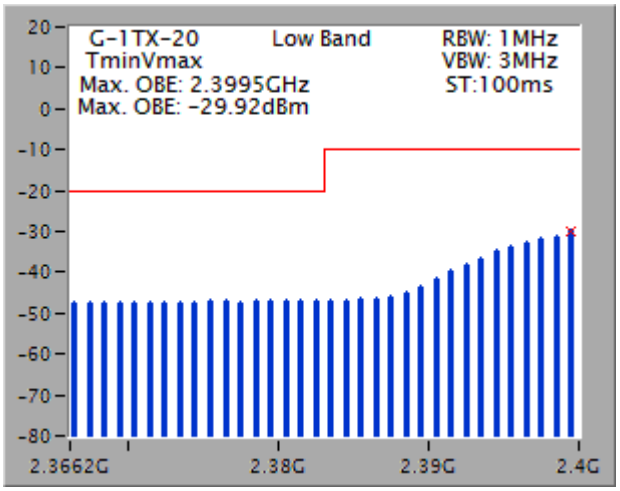
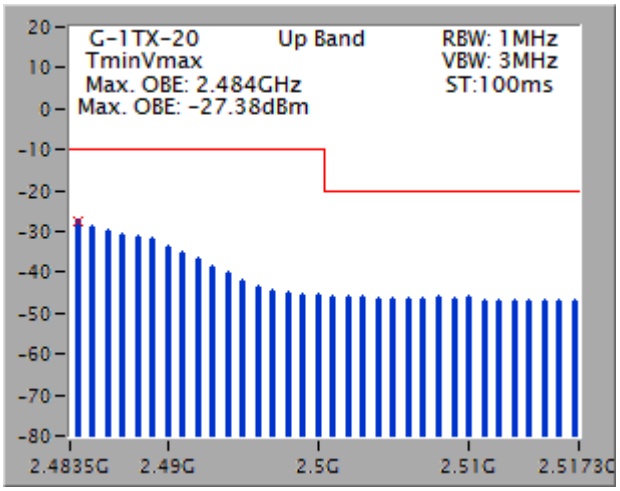
| Test Method | | | |
|---|---|---|---|
| ☒ | The measurements shall be performed at both normal environmental conditions and at the extremes of the operating temperature range. | | |
| ☒ | Refer as EN 300 328, clause 5.3.9.2.1 for conducted measurement. | | |
| | ☐ | The EUT supports single transmit chain and measurements performed on this transmit chain 2. | |
| | ☒ | The EUT supports diversity transmitting and the results on transmit chain port 2 is the worst case. | |
| | ☒ | The EUT supports multiple transmit chains using options given below: | |
| | | ☒ | Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added and compared with the transmit mask limit. |
| | | ☐ | Option 2: the results for each of the transmit chains shall be individually compared with the transmit mask limit. After that these limits have been reduced with 10 x $\log_{10}$ ($A_{ch}$). (Number of active transmit chains). |
| ☐ | Refer as EN 300 328, clause 5.3.9.2.2 for radiated measurement. | | |

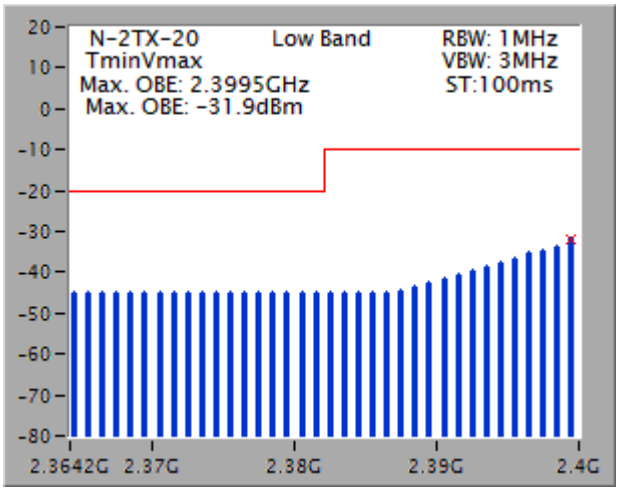
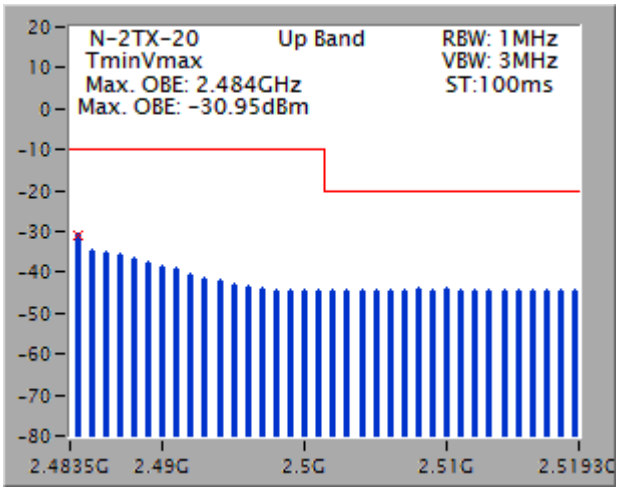
### 3.4.4 Test Setup

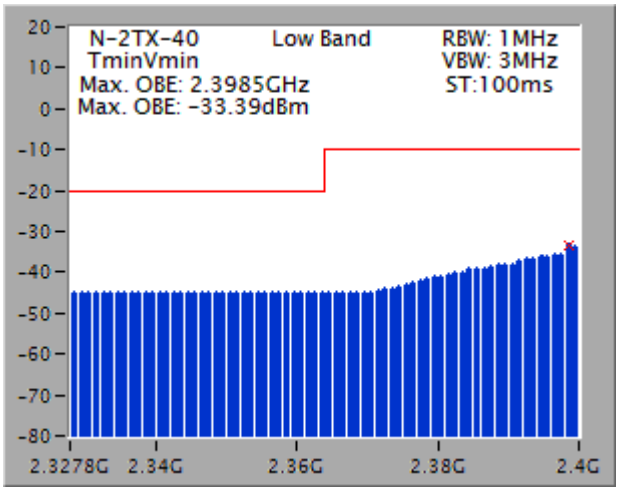
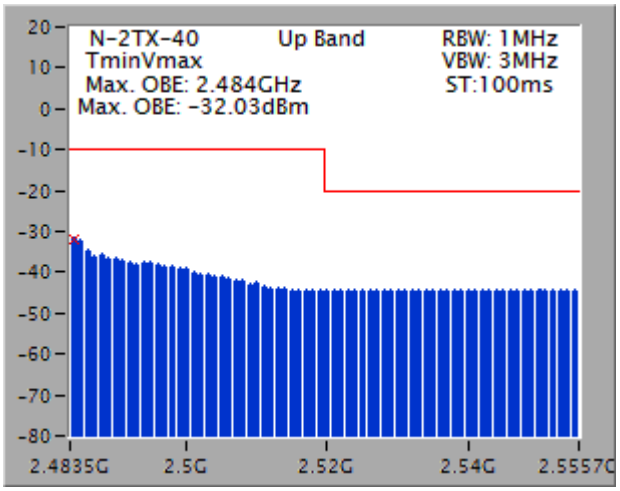
| Transmitter Unwanted Emissions in the Out-of-band Domain |
| --- |
|  |

### 3.4.5 Test Result of Transmitter Unwanted Emissions in the Out-of-band Domain

| Transmitter Unwanted Emissions in the Out-of-band Domain Result | | | | | | |
|---|---|---|---|---|---|---|
| Test Date: Sep. 22, 2014 | | OOB Emissions (dBm/MHz) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | OOB Freq. (MHz) | OOB Emissions | Limit |
| TnomVnom | 11b | 1 | 2412 | 2397.5 | -36.99 | -10 |
| TminVmax | 11b | 1 | 2412 | 2397.5 | -34.84 | -10 |
| TminVmin | 11b | 1 | 2412 | 2397.5 | -34.85 | -10 |
| TmaxVmax | 11b | 1 | 2412 | 2397.5 | -41.91 | -10 |
| TmaxVmin | 11b | 1 | 2412 | 2397.5 | -41.90 | -10 |
| TnomVnom | 11b | 1 | 2472 | 2487.0 | -33.37 | -10 |
| TminVmax | 11b | 1 | 2472 | 2487.0 | -31.23 | -10 |
| TminVmin | 11b | 1 | 2472 | 2487.0 | -31.24 | -10 |
| TmaxVmax | 11b | 1 | 2472 | 2487.0 | -38.15 | -10 |
| TmaxVmin | 11b | 1 | 2472 | 2487.0 | -38.14 | -10 |
| Low Band | | | | Up Band | | |
|  | | | |  | | |
| Result | | | | Complied | | |

| Transmitter Unwanted Emissions in the Out-of-band Domain Result | | | | | | |
|---|---|---|---|---|---|---|
| Test Date: Sep. 22, 2014 | | OOB Emissions (dBm/MHz) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | OOB Freq. (MHz) | OOB Emissions | Limit |
| TnomVnom | 11g | 1 | 2412 | 2399.5 | -32.69 | -10 |
| TminVmax | 11g | 1 | 2412 | 2399.5 | -29.92 | -10 |
| TminVmin | 11g | 1 | 2412 | 2399.5 | -29.96 | -10 |
| TmaxVmax | 11g | 1 | 2412 | 2399.5 | -36.25 | -10 |
| TmaxVmin | 11g | 1 | 2412 | 2399.5 | -36.28 | -10 |
| TnomVnom | 11g | 1 | 2472 | 2484.0 | -30.29 | -10 |
| TminVmax | 11g | 1 | 2472 | 2484.0 | -27.38 | -10 |
| TminVmin | 11g | 1 | 2472 | 2484.0 | -27.38 | -10 |
| TmaxVmax | 11g | 1 | 2472 | 2484.0 | -35.34 | -10 |
| TmaxVmin | 11g | 1 | 2472 | 2484.0 | -35.42 | -10 |
| Low Band | | | | Up Band | | |
|  | | | |  | | |
| Result | | | | Complied | | |

| Transmitter Unwanted Emissions in the Out-of-band Domain Result | | | | | | |
|---|---|---|---|---|---|---|
| Test Date: Sep. 22, 2014 | | OOB Emissions (dBm/MHz) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | OOB Freq. (MHz) | OOB Emissions | Limit |
| TnomVnom | HT20 | 2 | 2412 | 2399.5 | -33.92 | -10 |
| TminVmax | HT20 | 2 | 2412 | 2399.5 | -31.90 | -10 |
| TminVmin | HT20 | 2 | 2412 | 2399.5 | -31.90 | -10 |
| TmaxVmax | HT20 | 2 | 2412 | 2399.5 | -37.14 | -10 |
| TmaxVmin | HT20 | 2 | 2412 | 2399.5 | -37.26 | -10 |
| TnomVnom | HT20 | 2 | 2472 | 2484.0 | -32.72 | -10 |
| TminVmax | HT20 | 2 | 2472 | 2484.0 | -30.95 | -10 |
| TminVmin | HT20 | 2 | 2472 | 2484.0 | -30.95 | -10 |
| TmaxVmax | HT20 | 2 | 2472 | 2484.0 | -35.83 | -10 |
| TmaxVmin | HT20 | 2 | 2472 | 2484.0 | -35.89 | -10 |
| Low Band | | | | Up Band | | |
|  | | | |  | | |
| Result | | | | Complied | | |

| Transmitter Unwanted Emissions in the Out-of-band Domain Result | | | | | | |
|---|---|---|---|---|---|---|
| Test Date: Sep. 22, 2014 | | OOB Emissions (dBm/MHz) | | | | |
| Condition | Modulation Mode | $N_{TX}$ | Freq. (MHz) | OOB Freq. (MHz) | OOB Emissions | Limit |
| TnomVnom | HT40 | 2 | 2422 | 2398.5 | -35.52 | -10 |
| TminVmax | HT40 | 2 | 2422 | 2398.5 | -33.42 | -10 |
| TminVmin | HT40 | 2 | 2422 | 2398.5 | -33.39 | -10 |
| TmaxVmax | HT40 | 2 | 2422 | 2398.5 | -38.21 | -10 |
| TmaxVmin | HT40 | 2 | 2422 | 2398.5 | -38.26 | -10 |
| TnomVnom | HT40 | 2 | 2462 | 2484.0 | -34.08 | -10 |
| TminVmax | HT40 | 2 | 2462 | 2484.0 | -32.03 | -10 |
| TminVmin | HT40 | 2 | 2462 | 2484.0 | -32.03 | -10 |
| TmaxVmax | HT40 | 2 | 2462 | 2484.0 | -36.84 | -10 |
| TmaxVmin | HT40 | 2 | 2462 | 2484.0 | -36.90 | -10 |
| Low Band | | | | Up Band | | |
|  | | | |  | | |
| Result | | | | Complied | | |

# 3.5 Transmitter Unwanted Emissions in the Spurious Domain

## 3.5.1 Transmitter Unwanted Emissions in the Spurious Domain Limit

| Frequency Range | Maximum Power e.r.p. (≤1 GHz) ; e.i.r.p. (>1 GHz) | Bandwidth |
|---|---|---|
| 30 MHz to 47 MHz | -36 dBm | 100 kHz |
| 47 MHz to 74 MHz | -54 dBm | 100 kHz |
| 74 MHz to 87,5 MHz | -36 dBm | 100 kHz |
| 87,5 MHz to 118 MHz | -54 dBm | 100 kHz |
| 118 MHz to 174 MHz | -36 dBm | 100 kHz |
| 174 MHz to 230 MHz | -54 dBm | 100 kHz |
| 230 MHz to 470 MHz | -36 dBm | 100 kHz |
| 470 MHz to 862 MHz | -54 dBm | 100 kHz |
| 862 MHz to 1 GHz | -36 dBm | 100 kHz |
| 1 GHz to 12,75 GHz | -30 dBm | 1 MHz |
| Note 1: spurious domain ≤ (2400 MHz – 2N) and spurious domain ≥ (2483.5 MHz + 2N); N = MAX (1, Occupied Channel Bandwidth) MHz | | |

## 3.5.2 Measuring Instruments

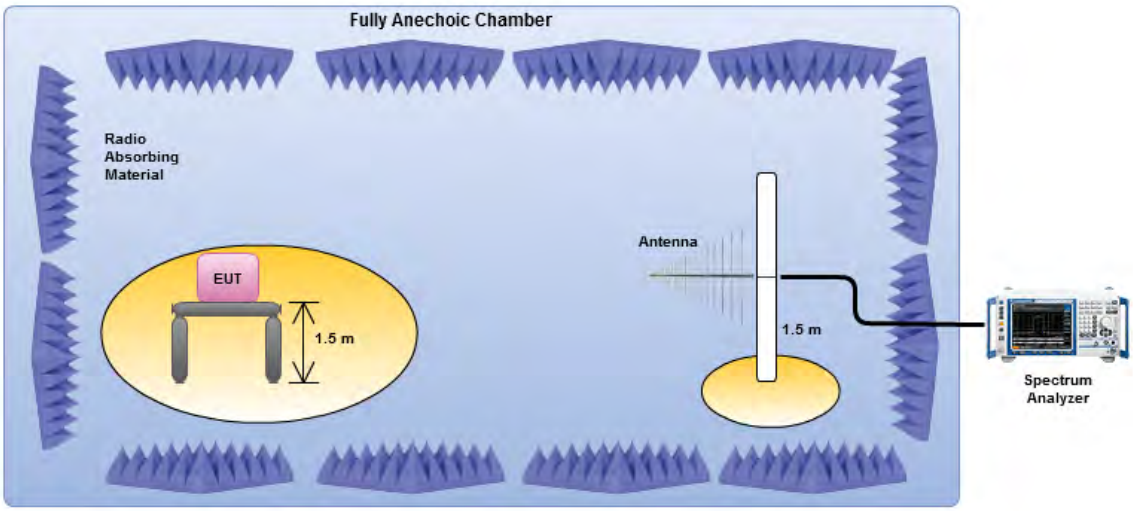
Refer a test equipment and calibration data table in this test report.

## 3.5.3 Test Procedures

| Test Method | | | |
|---|---|---|---|
| ☐ | Refer as EN 300 328, clause 5.3.10.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation). | | |
| | ☐ | The EUT supports single transmit chain and measurements performed on this transmit chain. | |
| | ☐ | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. | |
| | ☐ | The EUT supports multiple transmit chains using options given below: | |
| | | ☐ | Option 1: The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the transmitter spurious emissions limit. |
| | | ☐ | Option 2: the results for each of the transmit chains shall be individually compared with the transmitter spurious emissions limit. After that these limits have been reduced with 10 x $\log_{10}$ ($A_{ch}$). (Number of active transmit chains). |
| | ☐ | Equipment with single transmit chain. All measurement had be performed on this transmit chain. | |
| ☒ | Refer as EN 300 328, clause 5.3.10.2.2 for radiated measurement. | | |

### 3.5.4 Test Setup

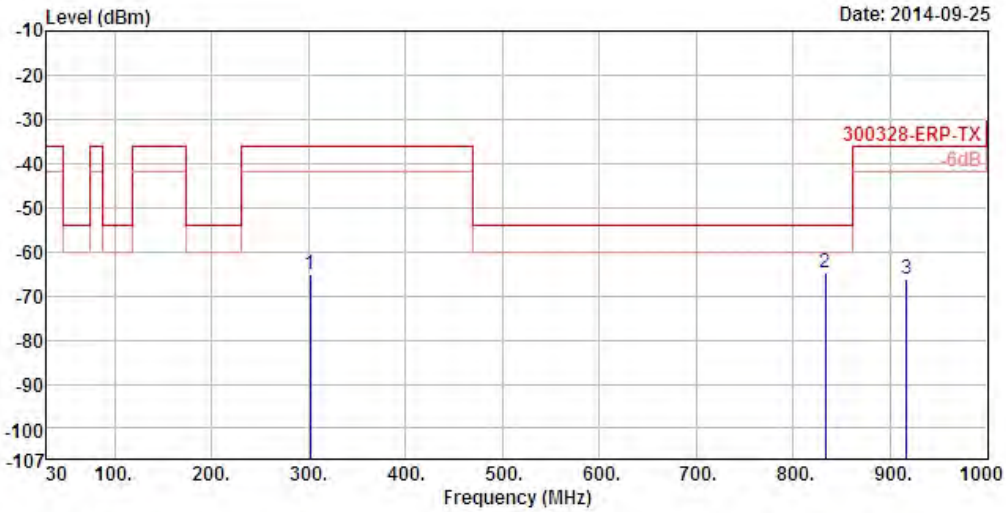
**Transmitter Unwanted Emissions in the Spurious Domain**




A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring far field distance may be used, depending on the test system noise floor for detecting spurious emission signals. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance. The height of the equipment or of the substitution antenna shall be 1.5 m.

### 3.5.5 Transmitter Radiated Unwanted Emissions (Below 1GHz)

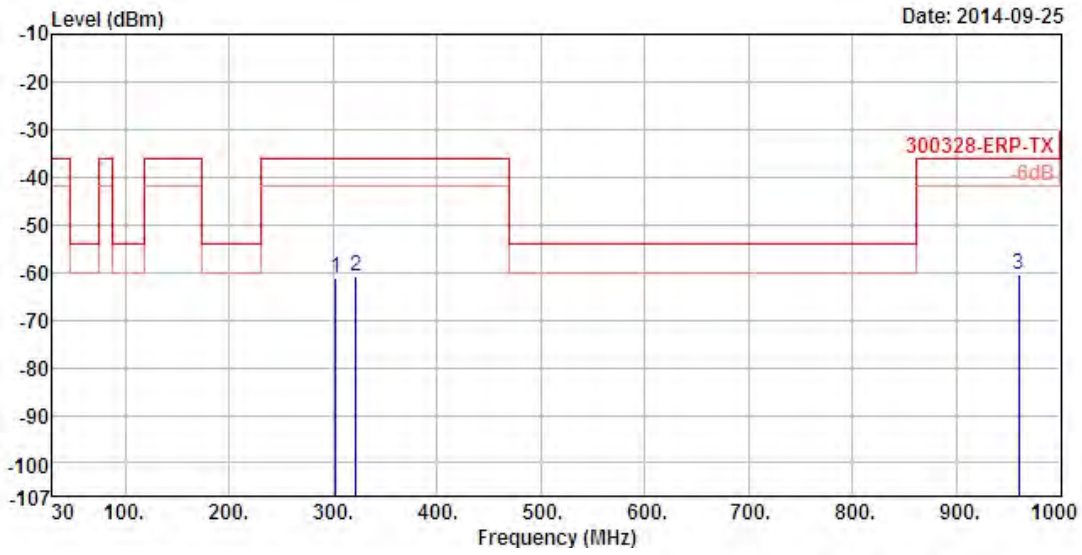
| Transmitter Radiated Unwanted Emissions (Below 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Polarization** | V |
| **Operating Mode** | 1 | **Operating Function** | Transmit |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 301.60 | -65.06 | -29.06 | -36.00 | -70.74 | 5.68 |
| 2 | 833.16 | -64.89 | -10.89 | -54.00 | -72.51 | 7.62 |
| 3 | 916.58 | -66.24 | -30.24 | -36.00 | -74.97 | 8.73 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Transmitter Radiated Unwanted Emissions (Below 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Polarization** | H |
| **Operating Mode** | 1 | **Operating Function** | Transmit |

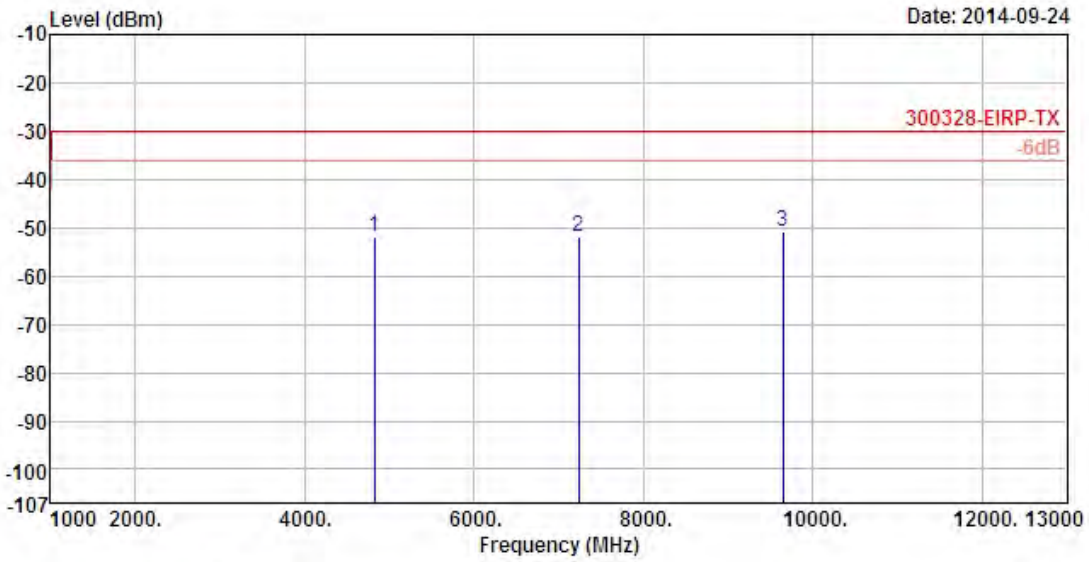



| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 302.57 | -61.24 | -25.24 | -36.00 | -60.13 | -1.11 |
| 2 | 321.97 | -60.68 | -24.68 | -36.00 | -60.32 | -0.36 |
| 3 | 960.23 | -60.59 | -24.59 | -36.00 | -70.00 | 9.41 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

### 3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

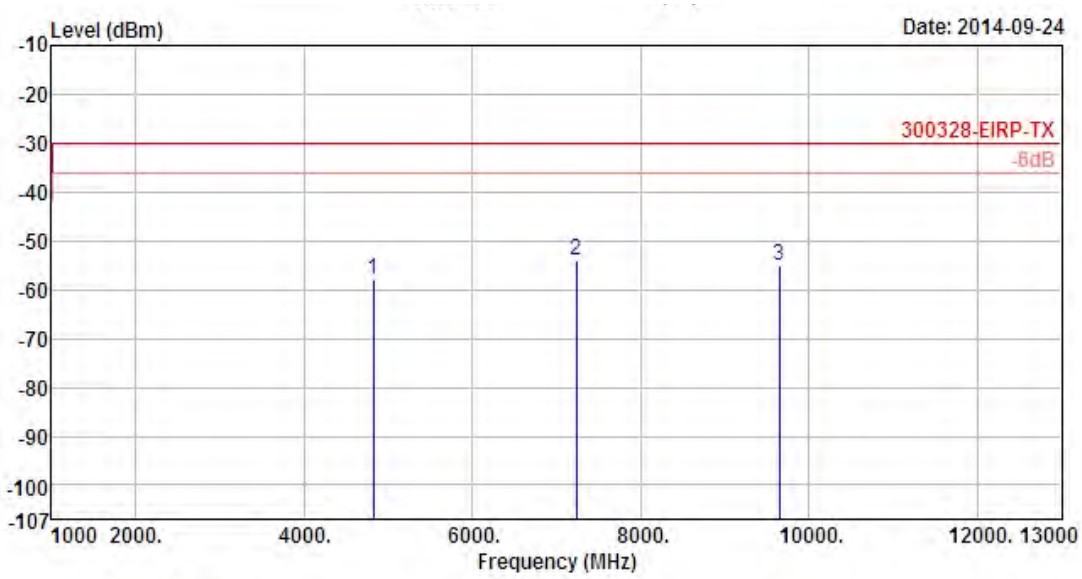
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11b | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -52.03 | -22.03 | -30.00 | -62.70 | 10.67 |
| 2 | 7236.00 | -51.73 | -21.73 | -30.00 | -68.51 | 16.78 |
| 3 | 9648.00 | -50.79 | -20.79 | -30.00 | -68.48 | 17.69 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

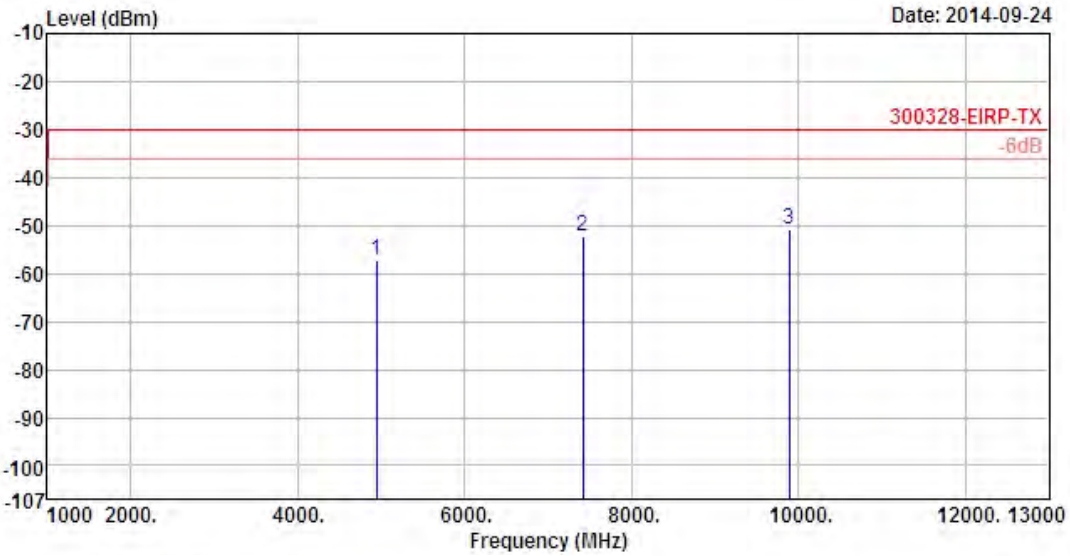
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11b | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | H |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -58.04 | -28.04 | -30.00 | -67.92 | 9.88 |
| 2 | 7236.00 | -54.12 | -24.12 | -30.00 | -68.54 | 14.42 |
| 3 | 9648.00 | -55.06 | -25.06 | -30.00 | -68.76 | 13.70 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

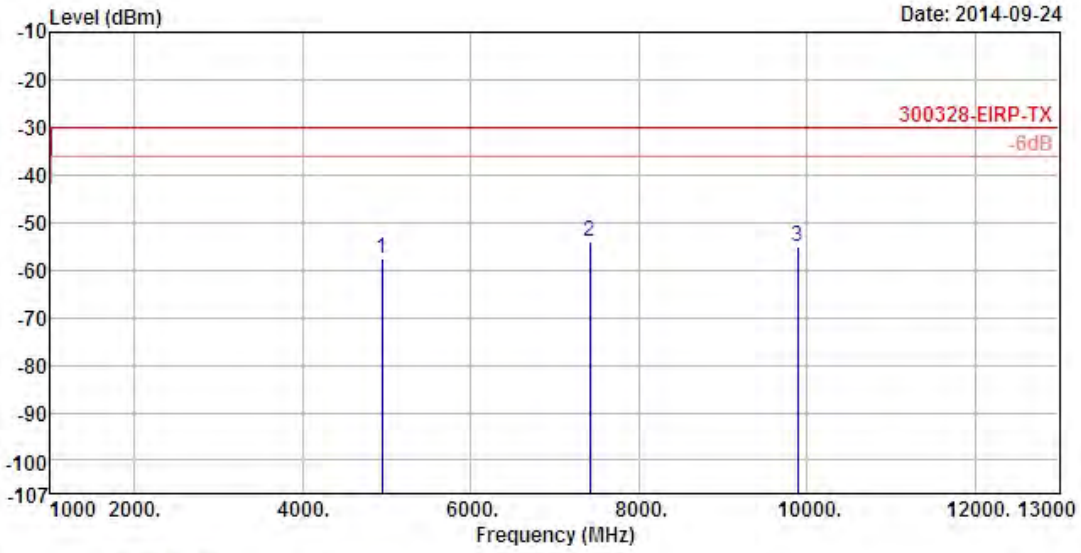
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11b | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -57.32 | -27.32 | -30.00 | -68.39 | 11.07 |
| 2 | 7416.00 | -52.22 | -22.22 | -30.00 | -69.55 | 17.33 |
| 3 | 9888.00 | -50.96 | -20.96 | -30.00 | -68.78 | 17.82 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11b | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | H |

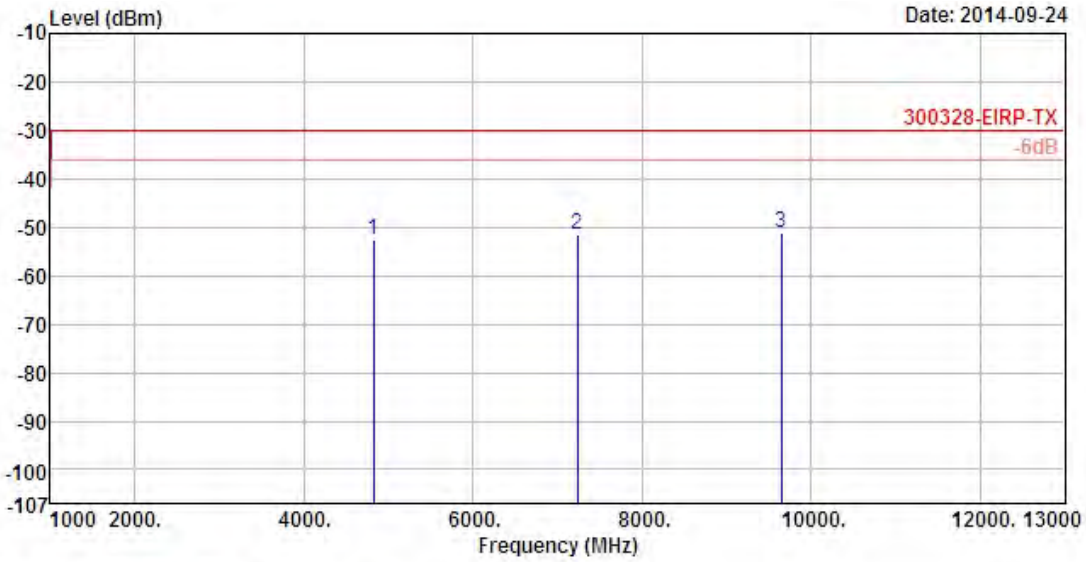



| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -57.69 | -27.69 | -30.00 | -68.05 | 10.36 |
| 2 | 7416.00 | -53.88 | -23.88 | -30.00 | -68.64 | 14.76 |
| 3 | 9888.00 | -55.18 | -25.18 | -30.00 | -68.86 | 13.68 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

### 3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

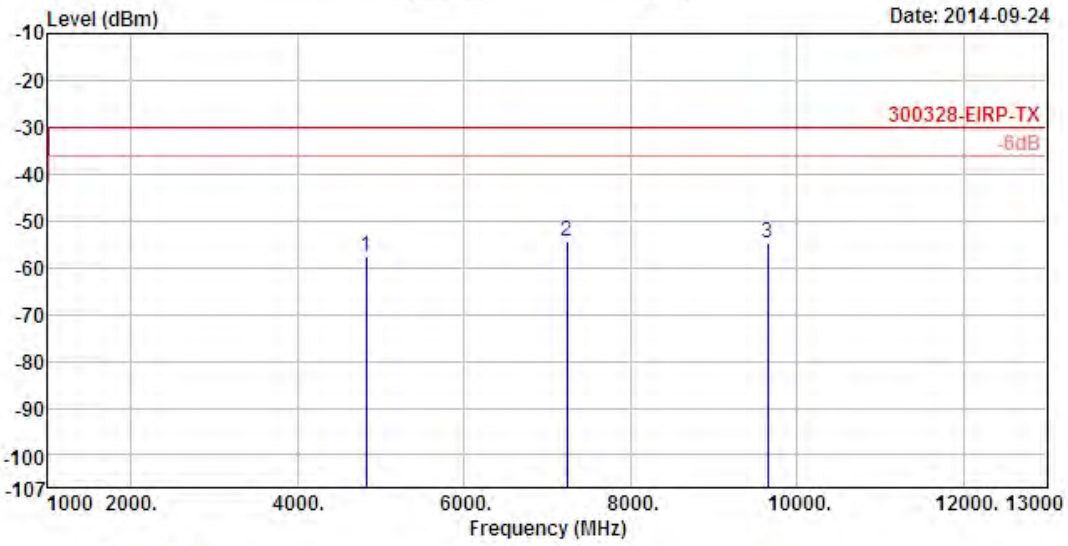
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11g | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -52.62 | -22.62 | -30.00 | -63.25 | 10.63 |
| 2 | 7236.00 | -51.53 | -21.53 | -30.00 | -68.31 | 16.78 |
| 3 | 9648.00 | -51.20 | -21.20 | -30.00 | -68.89 | 17.69 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

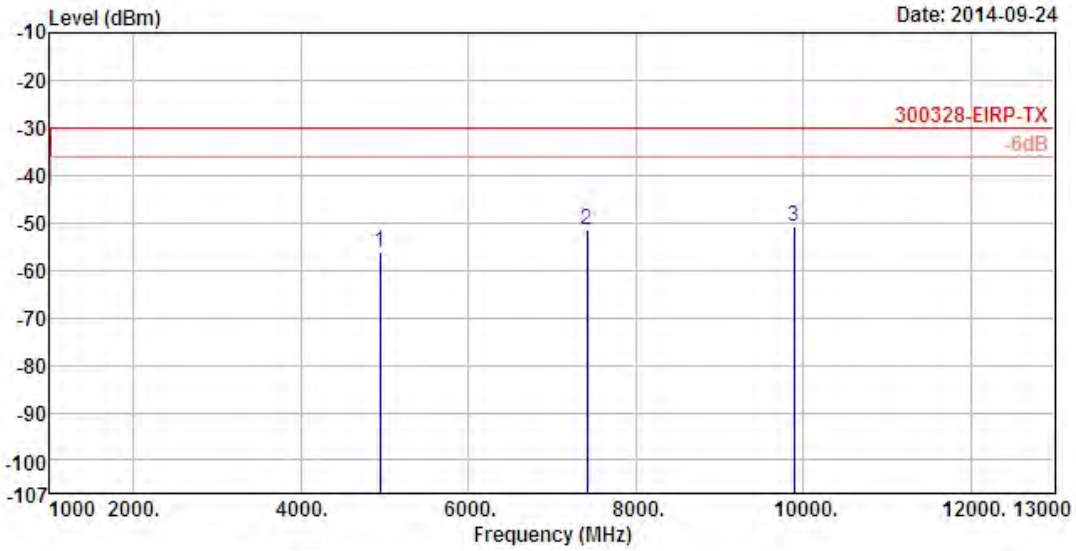
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11g | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | H |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -57.54 | -27.54 | -30.00 | -67.42 | 9.88 |
| 2 | 7236.00 | -54.23 | -24.23 | -30.00 | -68.65 | 14.42 |
| 3 | 9648.00 | -54.79 | -24.79 | -30.00 | -68.49 | 13.70 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

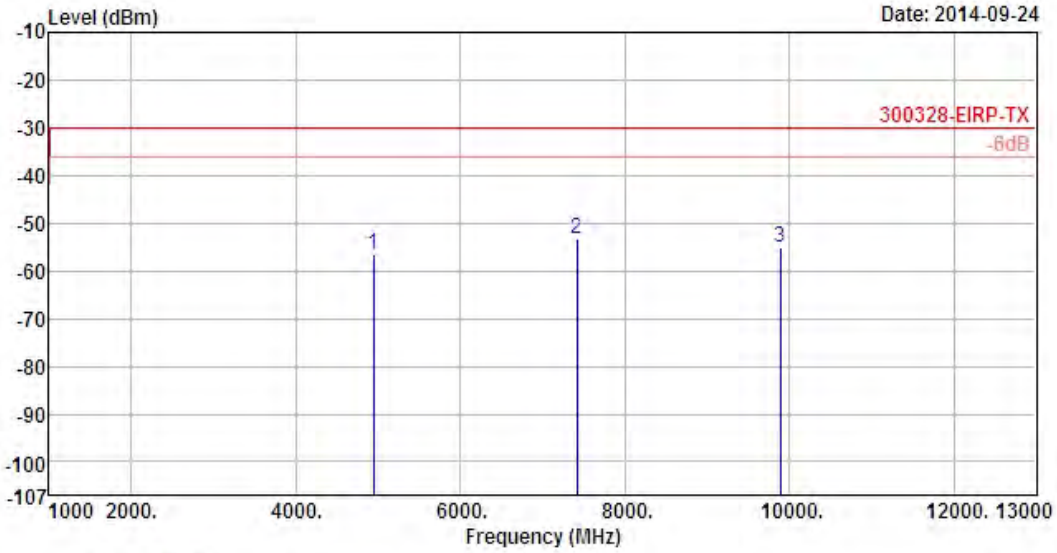
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11g | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -56.26 | -26.26 | -30.00 | -67.33 | 11.07 |
| 2 | 7416.00 | -51.53 | -21.53 | -30.00 | -68.86 | 17.33 |
| 3 | 9888.00 | -50.76 | -20.76 | -30.00 | -68.58 | 17.82 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | 11g | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | H |

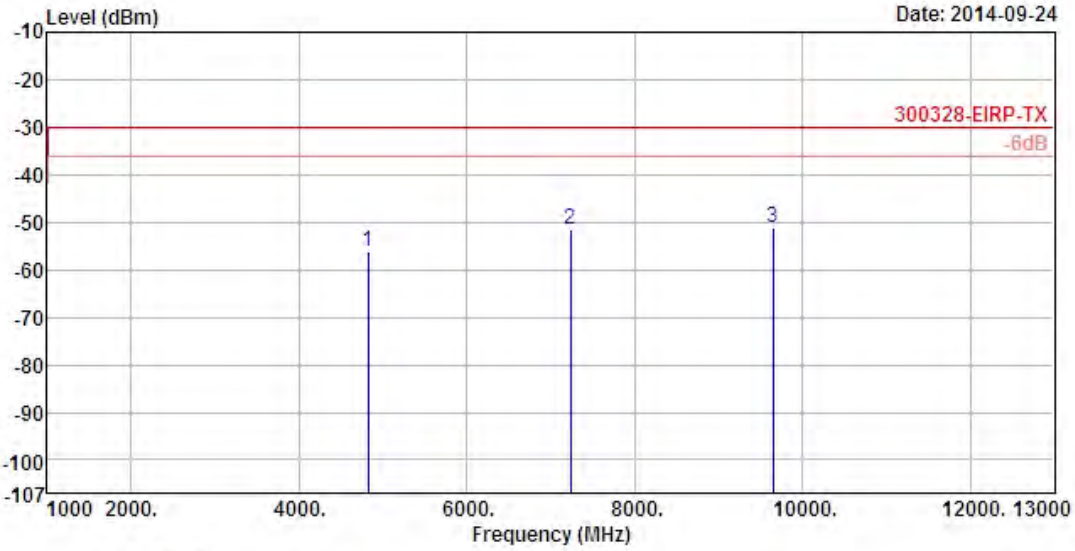



| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -56.53 | -26.53 | -30.00 | -66.87 | 10.34 |
| 2 | 7416.00 | -53.35 | -23.35 | -30.00 | -68.11 | 14.76 |
| 3 | 9888.00 | -55.01 | -25.01 | -30.00 | -68.69 | 13.68 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

### 3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

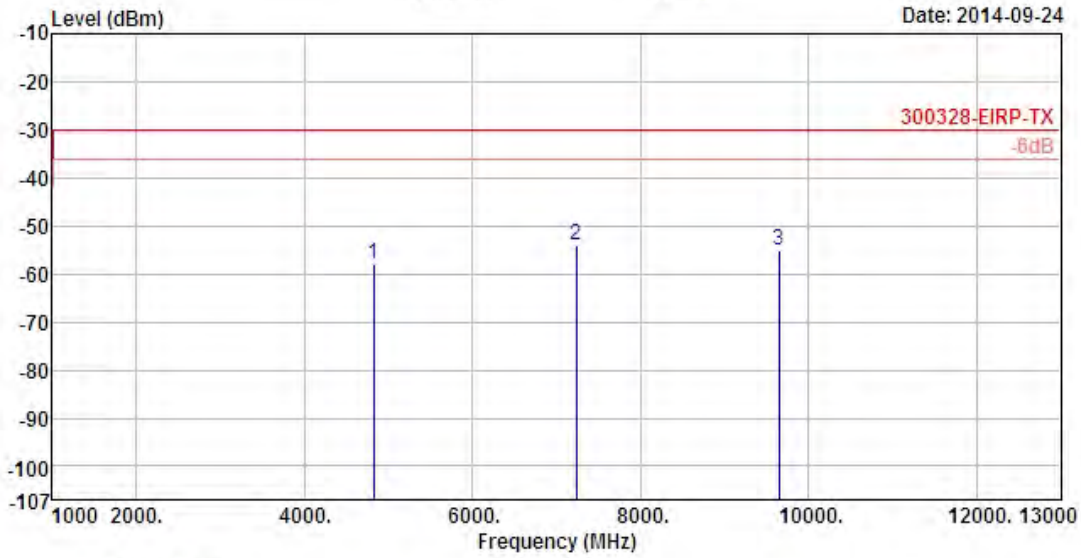
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT20 | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -56.14 | -26.14 | -30.00 | -66.81 | 10.67 |
| 2 | 7236.00 | -51.62 | -21.62 | -30.00 | -68.40 | 16.78 |
| 3 | 9648.00 | -51.03 | -21.03 | -30.00 | -68.72 | 17.69 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

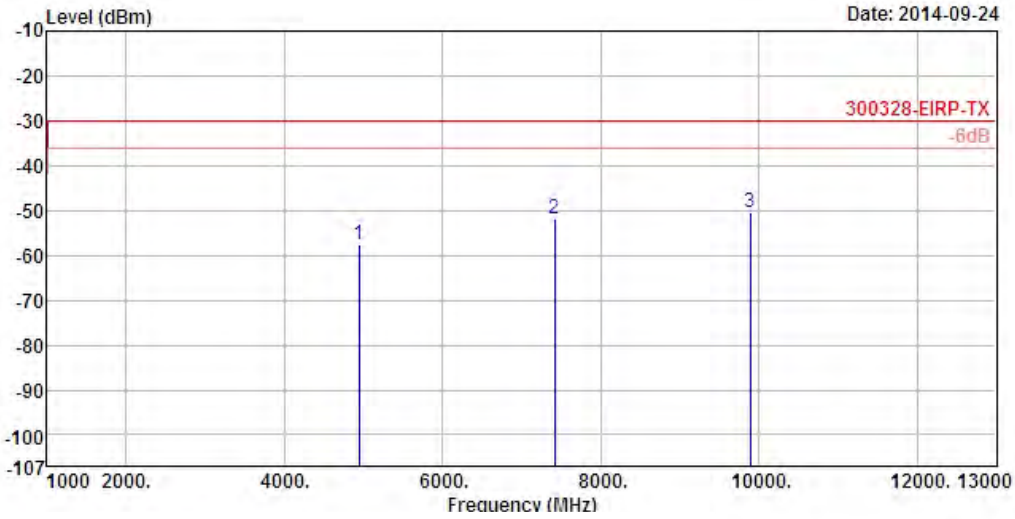
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT20 | **Test Freq. (FX)** | F1 |
| **Operating Function** | Transmit | **Polarization** | H |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4824.00 | -57.80 | -27.80 | -30.00 | -67.68 | 9.88 |
| 2 | 7236.00 | -54.02 | -24.02 | -30.00 | -68.44 | 14.42 |
| 3 | 9648.00 | -55.28 | -25.28 | -30.00 | -68.98 | 13.70 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

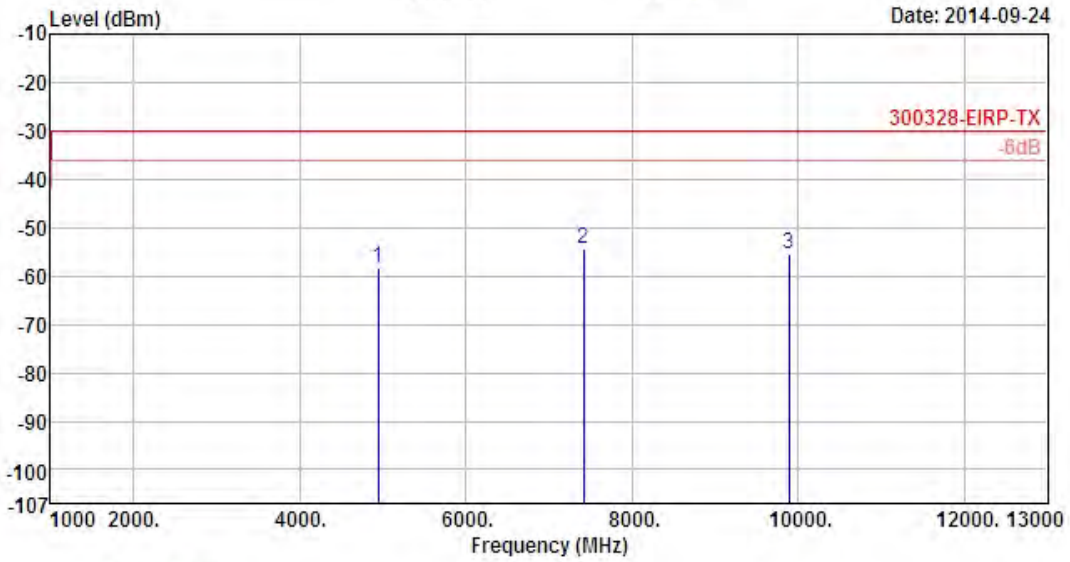
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT20 | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -57.51 | -27.51 | -30.00 | -68.58 | 11.07 |
| 2 | 7416.00 | -51.83 | -21.83 | -30.00 | -69.16 | 17.33 |
| 3 | 9888.00 | -50.55 | -20.55 | -30.00 | -68.37 | 17.82 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT20 | **Test Freq. (FX)** | F3 |
| **Operating Function** | Transmit | **Polarization** | H |

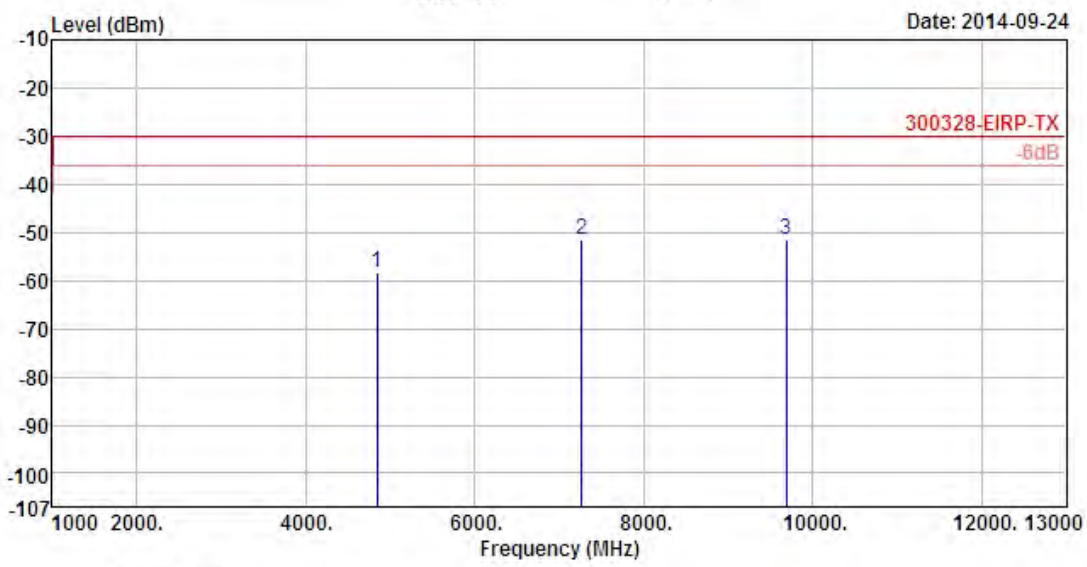



| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4944.00 | -58.15 | -28.15 | -30.00 | -68.51 | 10.36 |
| 2 | 7416.00 | -54.25 | -24.25 | -30.00 | -69.01 | 14.76 |
| 3 | 9888.00 | -55.28 | -25.28 | -30.00 | -68.96 | 13.68 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

### 3.5.9 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

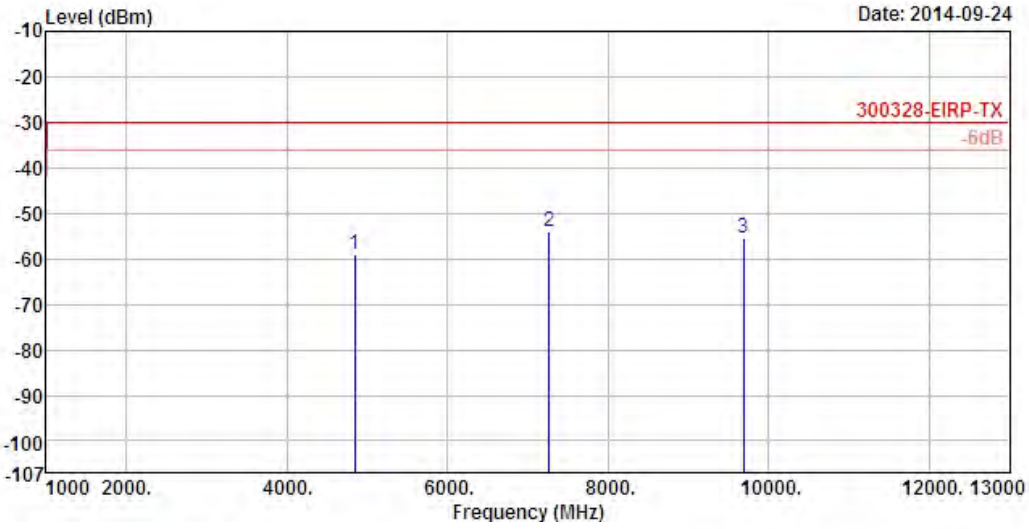
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Test Freq. (FX)** | F4 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4844.00 | -58.21 | -28.21 | -30.00 | -68.95 | 10.74 |
| 2 | 7266.00 | -51.57 | -21.57 | -30.00 | -68.44 | 16.87 |
| 3 | 9688.00 | -51.37 | -21.37 | -30.00 | -69.08 | 17.71 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

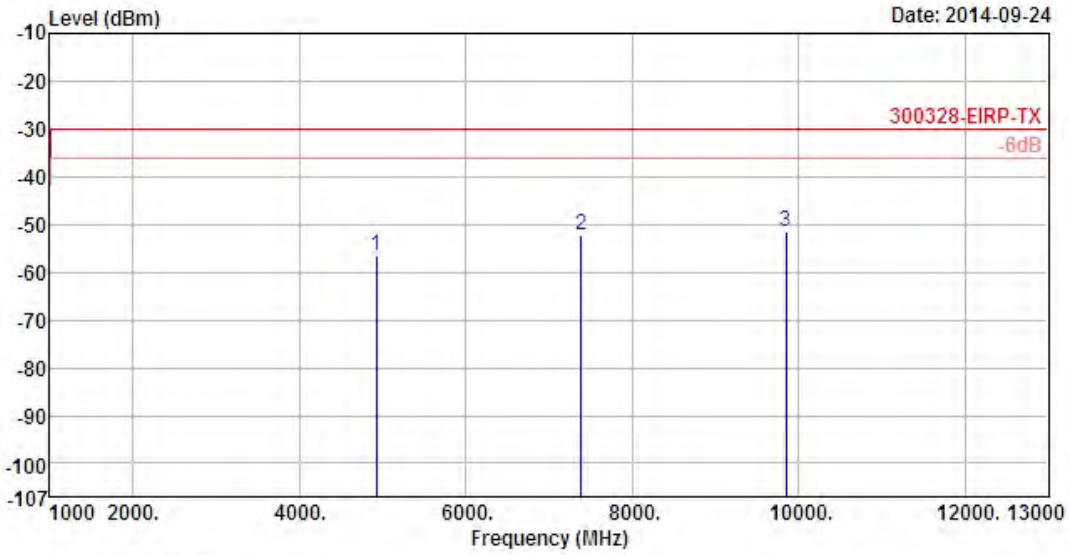
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Test Freq. (FX)** | F4 |
| **Operating Function** | Transmit | **Polarization** | H |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4844.00 | -58.86 | -28.86 | -30.00 | -68.82 | 9.96 |
| 2 | 7266.00 | -54.00 | -24.00 | -30.00 | -68.47 | 14.47 |
| 3 | 9688.00 | -55.53 | -25.53 | -30.00 | -69.23 | 13.70 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

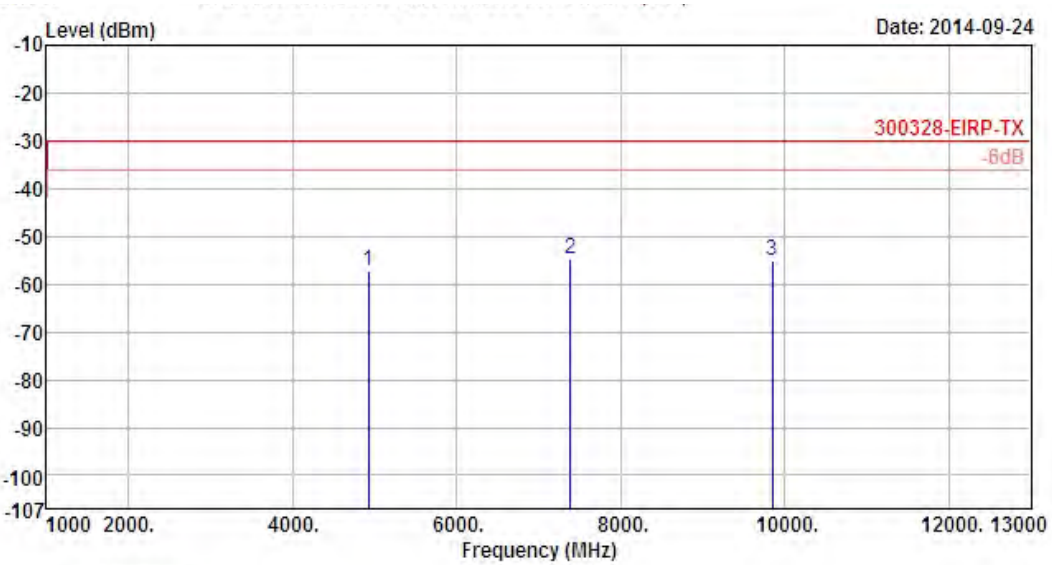
| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Test Freq. (FX)** | F6 |
| **Operating Function** | Transmit | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4924.00 | -56.54 | -26.54 | -30.00 | -67.55 | 11.01 |
| 2 | 7386.00 | -52.17 | -22.17 | -30.00 | -69.41 | 17.24 |
| 3 | 9848.00 | -51.35 | -21.35 | -30.00 | -69.15 | 17.80 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Transmitter Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Modulation Mode** | HT40 | **Test Freq. (FX)** | F6 |
| **Operating Function** | Transmit | **Polarization** | H |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 4924.00 | -57.23 | -27.23 | -30.00 | -67.51 | 10.28 |
| 2 | 7386.00 | -54.74 | -24.74 | -30.00 | -69.45 | 14.71 |
| 3 | 9848.00 | -54.97 | -24.97 | -30.00 | -68.65 | 13.68 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

# 4 Receiver Test Result

## 4.1 Receiver Spurious Emissions

### 4.1.1 Receiver Spurious Emissions Limit

| Frequency Range | Maximum Power e.r.p. (≤1 GHz) ; e.i.r.p. (>1 GHz) | Bandwidth |
|---|---|---|
| 30 MHz to 1 GHz | -57 dBm | 100 kHz |
| 1 GHz to 12,75 GHz | -47 dBm | 1 MHz |

### 4.1.2 Measuring Instruments

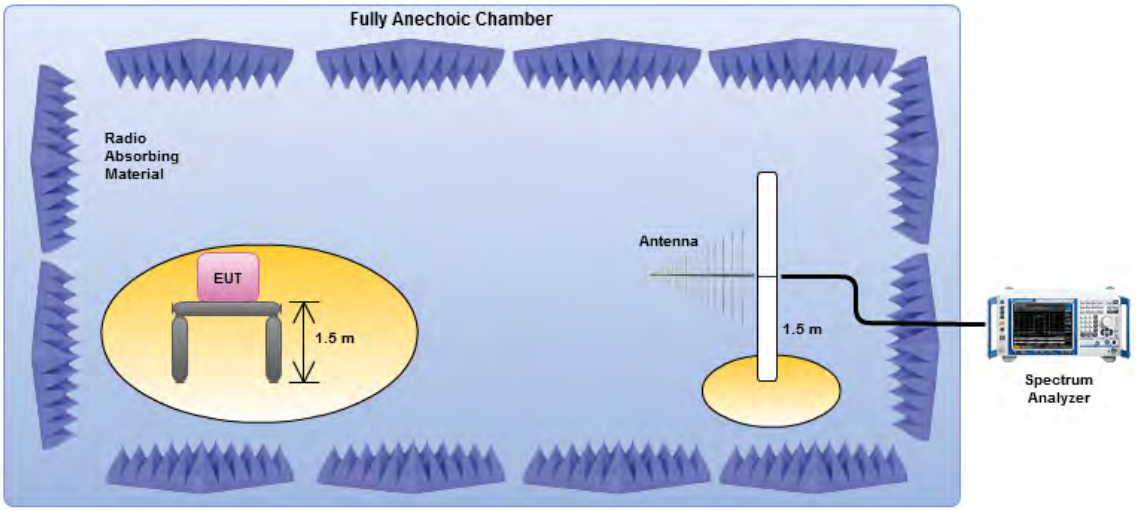
Refer a test equipment and calibration data table in this test report.

### 4.1.3 Test Procedures

| Test Method | | | |
|---|---|---|---|
| ☐ | Refer as EN 300 328, clause 5.3.11.2.1 for conducted measurement. Conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation). | | |
| | ☐ | The EUT supports single receive chain and measurements performed on this receive chain. | |
| | ☐ | The EUT supports diversity receiving and the results on receive chain port 1 is the worst case. | |
| | ☐ | The EUT supports multiple receive chains using options given below: | |
| | | ☐ | Option 1: The trace data for each receive chain has to be individually recorded and each receive chain trace data shall be added and compared with the receiver spurious emissions limit. |
| | | ☐ | Option 2: the results for each of the receive chains shall be individually compared with the receiver spurious emissions limit. After that these limits have been reduced with 10 x $\log_{10}$ ($A_{ch}$). (Number of active receive chains). |
| ☒ | Refer as EN 300 328, clause 5.3.11.2.2 for radiated measurement. | | |

### 4.1.4 Test Setup

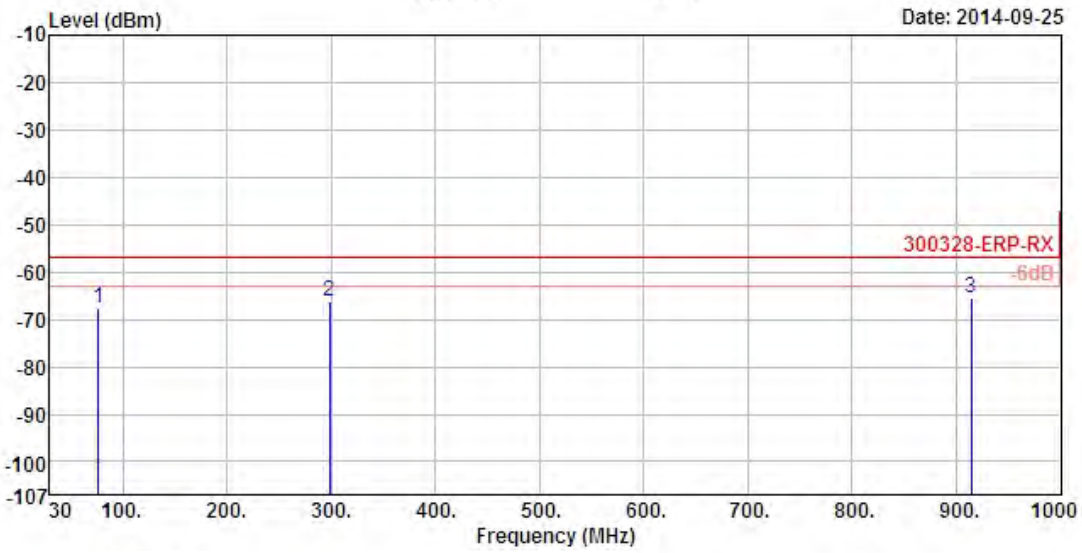
**Receiver Spurious Emissions**




A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring far field distance may be used, depending on the test system noise floor for detecting spurious emission signals. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance. The height of the equipment or of the substitution antenna shall be 1.5 m.

### 4.1.5 Receiver Radiated Spurious Emissions (Below 1GHz)

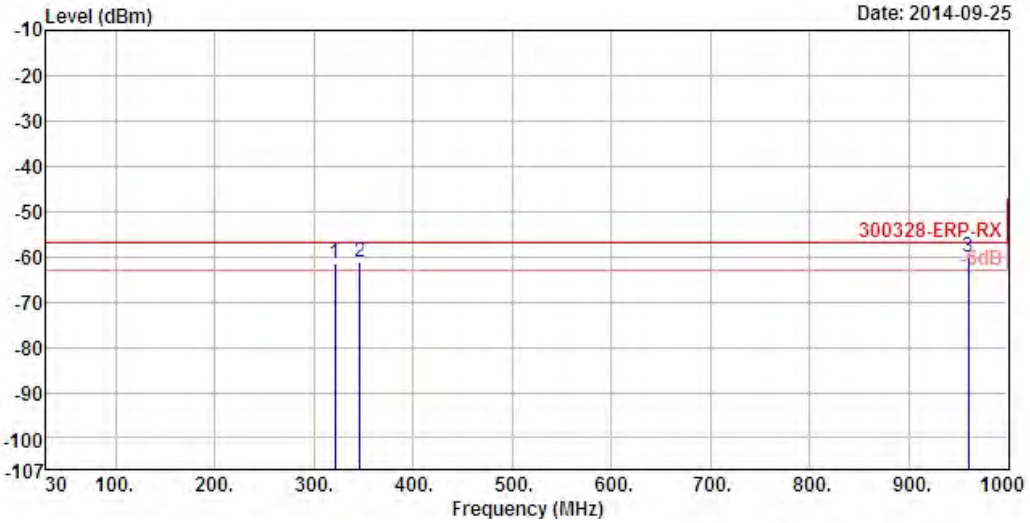
| Receiver Radiated Spurious Emissions (Below 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Polarization** | V |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 76.56 | -67.54 | -10.54 | -57.00 | -60.52 | -7.02 |
| 2 | 298.69 | -66.25 | -9.25 | -57.00 | -71.77 | 5.52 |
| 3 | 914.64 | -65.61 | -8.61 | -57.00 | -74.32 | 8.71 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Receiver Radiated Spurious Emissions (Below 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Polarization** | H |

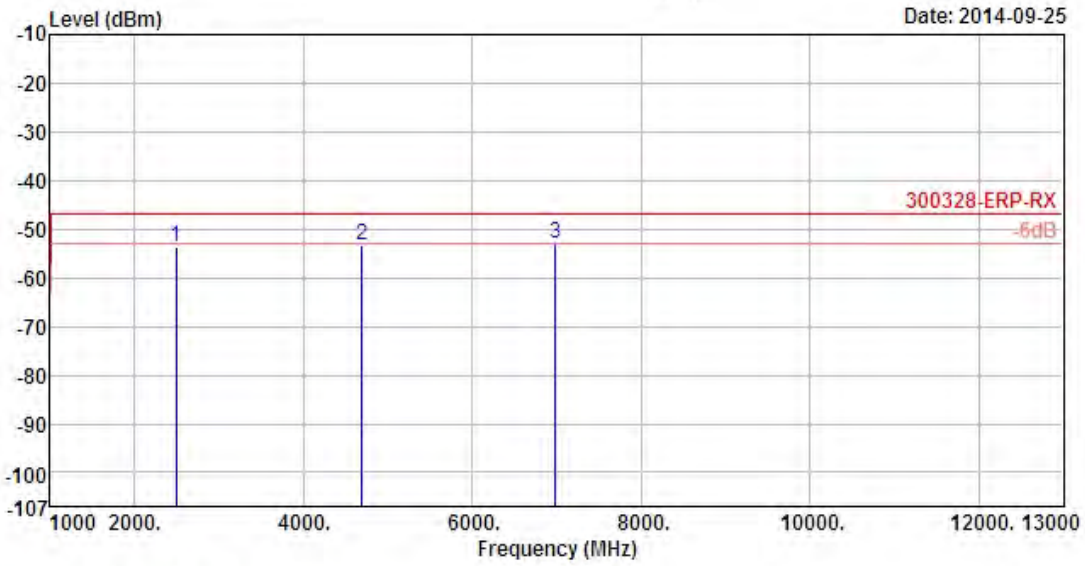



| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 321.00 | -61.57 | -4.57 | -57.00 | -61.18 | -0.39 |
| 2 | 346.22 | -61.22 | -4.22 | -57.00 | -61.73 | 0.51 |
| 3 | 960.23 | -60.25 | -3.25 | -57.00 | -69.66 | 9.41 |

Note 1: ">6dB" means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

## 4.1.6 Receiver Radiated Spurious Emissions (Above 1GHz)

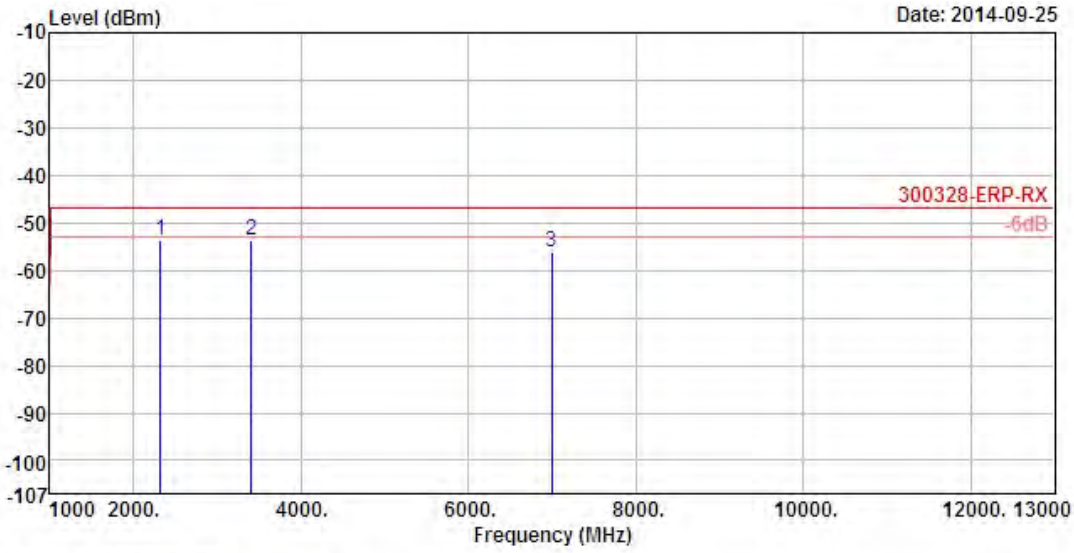
| Receiver Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Test Freq. (FX)** | F1 |
| **Polarization** | V | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 2496.00 | -53.62 | -6.62 | -47.00 | -57.60 | 3.98 |
| 2 | 4692.00 | -53.36 | -6.36 | -47.00 | -61.43 | 8.07 |
| 3 | 6980.00 | -53.00 | -6.00 | -47.00 | -66.77 | 13.77 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

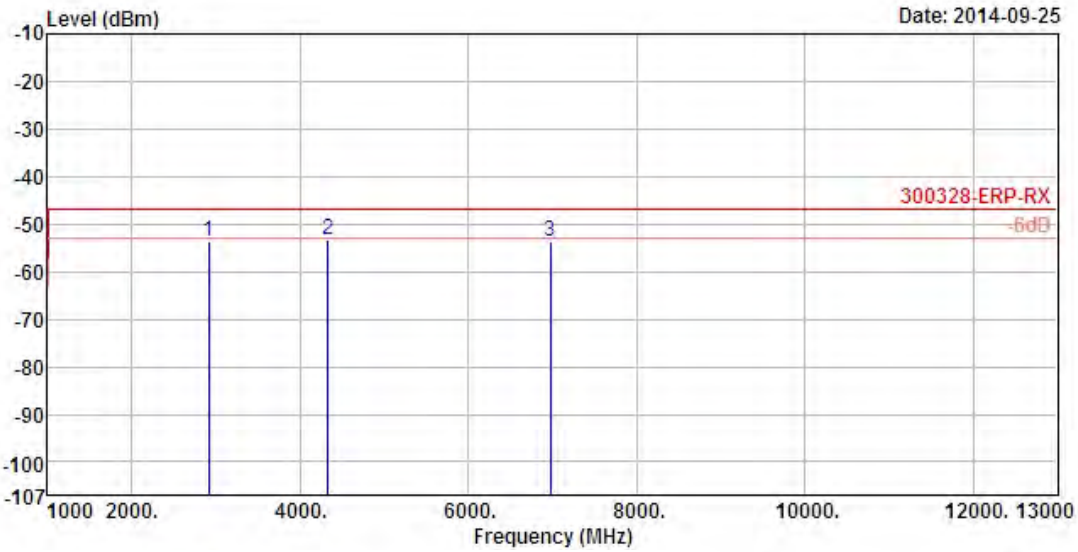
| Receiver Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Test Freq. (FX)** | F1 |
| **Polarization** | H | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 2322.00 | -53.84 | -6.84 | -47.00 | -57.83 | 3.99 |
| 2 | 3408.00 | -53.61 | -6.61 | -47.00 | -57.99 | 4.38 |
| 3 | 6998.00 | -56.15 | -9.15 | -47.00 | -67.95 | 11.80 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

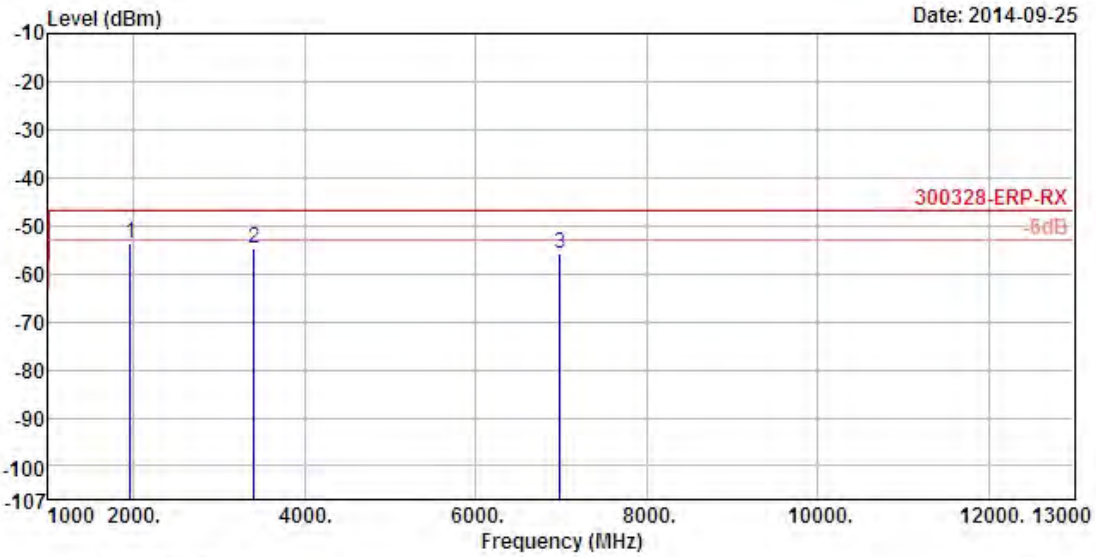
| Receiver Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Test Freq. (FX)** | F3 |
| **Polarization** | V | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 2910.00 | -53.55 | -6.55 | -47.00 | -57.37 | 3.82 |
| 2 | 4330.00 | -53.26 | -6.26 | -47.00 | -60.22 | 6.96 |
| 3 | 6974.00 | -53.67 | -6.67 | -47.00 | -67.40 | 13.73 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

| Receiver Radiated Spurious Emissions (Above 1GHz) | | | |
|---|---|---|---|
| **Operating Function** | Receive | **Test Freq. (FX)** | F3 |
| **Polarization** | H | | |




| | Freq | Level | Over Limit | Limit Line | Read Level | Factor |
|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB |
| 1 | 1954.00 | -53.67 | -6.67 | -47.00 | -57.54 | 3.87 |
| 2 | 3408.00 | -54.79 | -7.79 | -47.00 | -59.17 | 4.38 |
| 3 | 6988.00 | -55.68 | -8.68 | -47.00 | -67.43 | 11.75 |

Note 1: “>6dB” means spurious emission levels that exceed the level of 6 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

# 5 Adaptivity Test Result

## 5.1 Adaptivity and Receiver Blocking

### 5.1.1 Adaptivity and Receiver Blocking Limit

| Adaptivity and Receiver Blocking Limit |
|---|
| **Type of Equipment Using Wide Band Modulations Other than FHSS:** |
| ☒ Only for adaptive systems and RF Output Power > 10 dBm |
| ☐ Non-LBT based Detect and Avoid:<br>◆ minimum remain unavailable = 1sec;<br>◆ minimum Idle Period time = 100us;<br>◆ maximum Channel Occupancy Time (COT) = 40ms<br>◆ i.e. COT [40ms] + Idle Period [2ms - 5% of COT]; N x [COT+Idle];<br>◆ detection threshold level = -70 dBm/MHz + 20 - Pout e.i.r.p. (Pout in dBm); |
| ☐ LBT based Detect and Avoid (Frame Based Equipment):<br>◆ minimum Clear Channel Assessment (CCA) time = 20 us;<br>◆ CCA declared by the supplier<br>◆ COT = 1 ms to 10 ms<br>◆ Idle Period = 5% of COT<br>◆ e.g. CCA [120us] + COT [10ms] + Idle Period [0.5ms - 5% of COT];<br>◆ detection threshold level = -70 dBm/MHz + 20 - Pout e.i.r.p. (Pout in dBm); |
| ☒ LBT based Detect and Avoid (Load Based Equipment with spectrum sharing mechanism IEEE Std.):<br>◆ LBT based spectrum sharing mechanism may implement IEEE Std. 802.11-2007 clauses 15, 17, 18 or 19, in IEEE Std. 802.11n-2009, clause 20 or in IEEE Std. 802.15.4-2006, |
| ☐ LBT based Detect and Avoid (Load Based Equipment):<br>◆ minimum Clear Channel Assessment (CCA) time = 20 us;<br>◆ COT ≤ (13 / 32) x q ms; q=[4..32] ; 1.625ms – 13ms;<br>◆ R = number of clear idle slots are randomly [1..q]. Every time an Extended CCA is required and the R value stored in a counter. Extended CCA = R x CCA<br>◆ i.e. for channel occupied then R = 4 idle slots; COT [1.625ms; q=4]; idle slots [1] - Extended CCA [60us, R=3];<br>◆ detection threshold level = -70 dBm/MHz + 20 - Pout e.i.r.p. (Pout in dBm); |
| ☒ Short Control Signalling Transmissions:<br>◆ Short Control Signalling Transmissions shall have a maximum duty cycle of 10 % within an observation period of 50 ms. |

| Receiver Blocking Parameters | | | | |
|---|---|---|---|---|
| **Equipment Type** | **Wanted Signal Mean Power from Companion Device** | **Blocking Signal Frequency (MHz)** | **Blocking Signal Mean power (dBm)** | **Type of Interfering Signal** |
| LBT | sufficient to maintain the link (see note 2) | 2395 or 2488,5 (see note 1) | -30 | CW |
| Non-LBT | -30 dBm | | | |
| Note 1: The highest blocking frequency shall be used for testing the lowest operating hopping frequency, while the lowest blocking frequency shall be used for testing the highest hopping frequency.<br>Note 2: A typical value which can be used in most cases is -50 dBm/MHz. | | | | |

### 5.1.2 Measuring Instruments

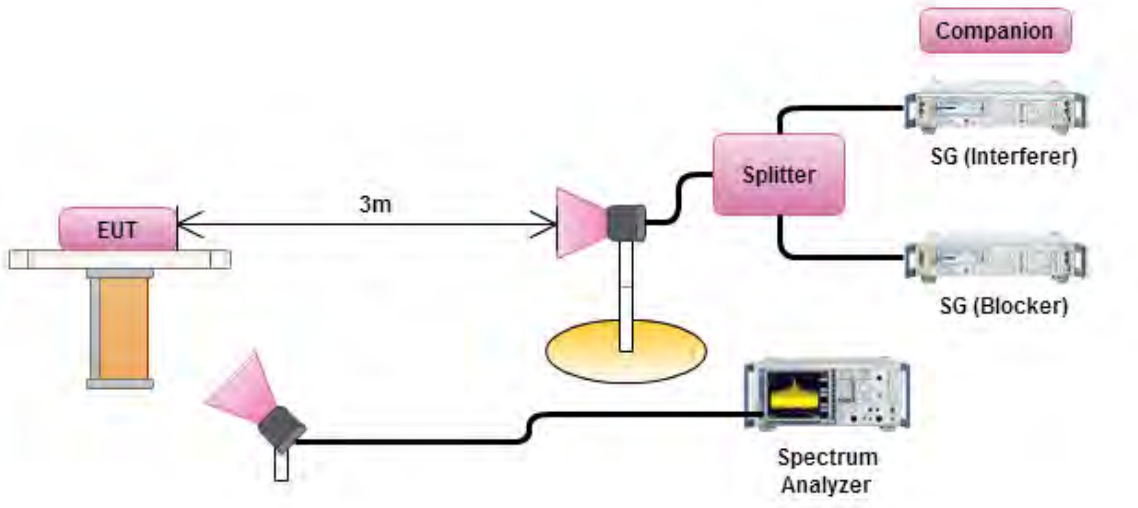
Refer a test equipment and calibration data table in this test report.

### 5.1.3 Test Procedures

| Test Method | |
|---|---|
| ☒ | Configure the EUT for normal transmissions with a sufficiently high payload to allow demonstration the adaptive mechanism. |
| ☐ | Refer as EN 300 328, clause 5.3.7.2.1 for conducted measurement. |
| ☐ | The EUT supports single receive chain and measurements performed on this receive chain. |
| ☐ | For conducted measurements on devices with multiple transmit chains and receive chains. The power splitter/combiner shall be used to combine all the transmit/receive chains (antenna outputs) into a single test point. The insertion loss of the power splitter/combiner shall be taken into account. |
| ☒ | Refer as EN 300 328, clause 5.3.7.2.2 for radiated measurement. |

### 5.1.4 Test Setup

**Adaptivity and Receiver Blocking – Radiated Method**

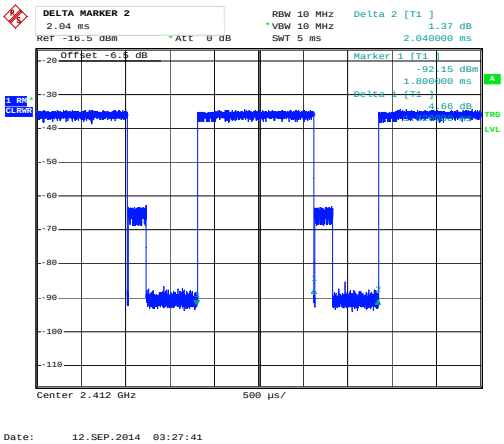
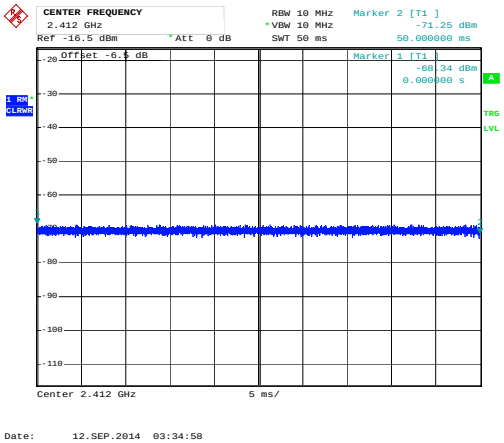
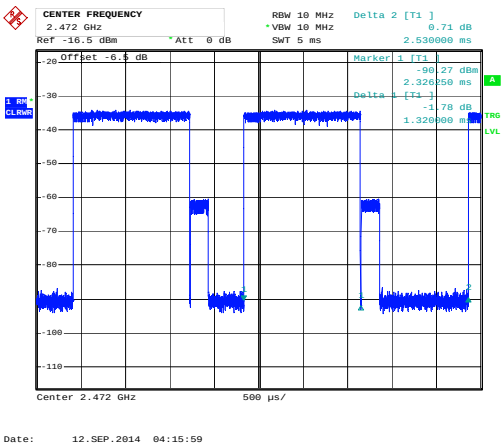
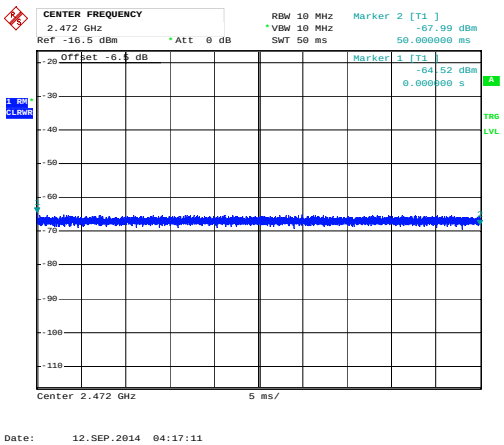


### 5.1.5 Test Result of Adaptivity and Receiver Blocking

| Adaptivity Result | | | | | |
|---|---|---|---|---|---|
| **Detection Threshold Level (dBm)** | | **-70 (-70 dBm/MHz + 20 - Pout e.i.r.p.)** | | | |
| **Modulation Mode** | **Freq. (MHz)** | **Channel Occupancy Time (ms)** | **Idle Period Time (ms)** | **Short Control Signalling Transmissions (ms)** | |
| | | | | **Bin** | **Time (ms)** |
| 11b | 2412 | 1.320000 | 0.7200000 | 0 | 0 |
| 11b | 2472 | 1.320000 | 1.2100000 | 0 | 0 |
| 11g | 2412 | 0.257000 | 0.1670000 | 0 | 0 |
| 11g | 2472 | 0.255000 | 0.2100000 | 0 | 0 |
| HT20 | 2412 | 1.340000 | 0.2000000 | 0 | 0 |
| HT20 | 2472 | 1.340000 | 0.2100000 | 0 | 0 |
| HT40 | 2422 | 0.542375 | 0.0596250 | 0 | 0 |
| HT40 | 2462 | 0.541000 | 0.0614375 | 0 | 0 |
| **Limit** | | N/A | N/A | 5 ms in 50ms period | |
| **Result** | | **Complied** | | | |
| Channel Occupancy Time and Idle Period Time follow as IEEE Std. 802.11-2007 and IEEE 802.11n-2009 specification without restirction. | | | | | |

| Receiver Blocking Result | | | | | |
|---|---|---|---|---|---|
| **Detection Threshold Level (dBm)** | | **-70 (-70 dBm/MHz + 20 - Pout e.i.r.p.)** | | | |
| **Modulation Mode** | **Freq. (MHz)** | **Channel Occupancy Time (ms)** | **Idle Period Time (ms)** | **Short Control Signalling Transmissions (ms)** | |
| | | | | **Bin** | **Time (ms)** |
| 11b | 2412 | 1.320000 | 1.160000 | 0 | 0 |
| 11b | 2472 | 1.320000 | 0.700000 | 0 | 0 |
| 11g | 2412 | 0.255875 | 0.220125 | 0 | 0 |
| 11g | 2472 | 0.255625 | 0.252000 | 0 | 0 |
| HT20 | 2412 | 1.340000 | 0.235000 | 0 | 0 |
| HT20 | 2472 | 1.340000 | 0.230000 | 0 | 0 |
| HT40 | 2422 | 0.458500 | 0.061500 | 0 | 0 |
| HT40 | 2462 | 0.459000 | 0.062000 | 0 | 0 |
| **Limit** | | N/A | N/A | 5 ms in 50ms period | |
| **Result** | | **Complied** | | | |
| Channel Occupancy Time and Idle Period Time follow as IEEE Std. 802.11-2007 specification without restirction. | | | | | |

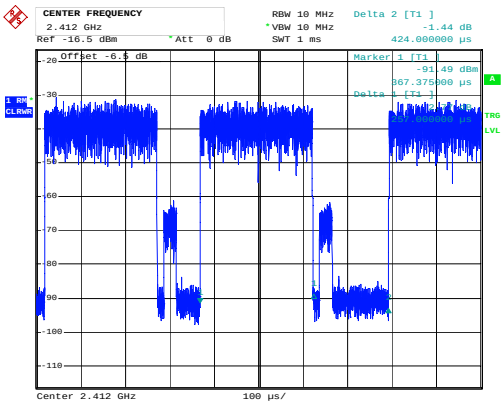
## 5.1.6 Test Result of Adaptivity Time Plots

| Adaptivity Result Time Plots | |
|---|---|
| **11b - F1 - Channel Occupancy Time/ Idle Period** | **11b - F1 - Short Control Signalling Transmissions** |
|  |  |
| **11b - F3 - Channel Occupancy Time/ Idle Period** | **11b – F3 - Short Control Signalling Transmissions** |
|  |  |

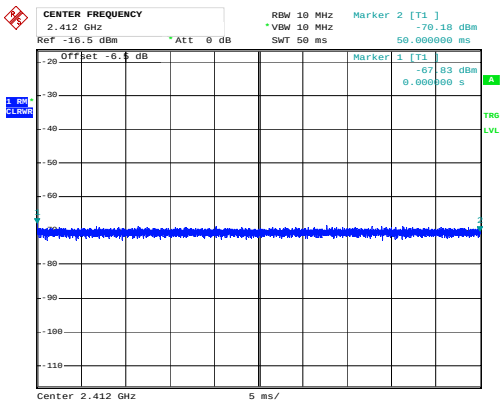
Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

## Adaptivity Result Time Plots

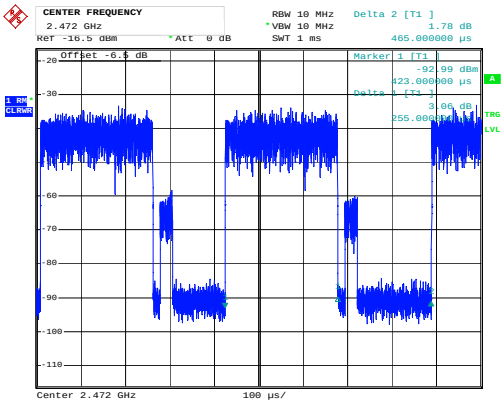
### 11g - F1 - Channel Occupancy Time/ Idle Period



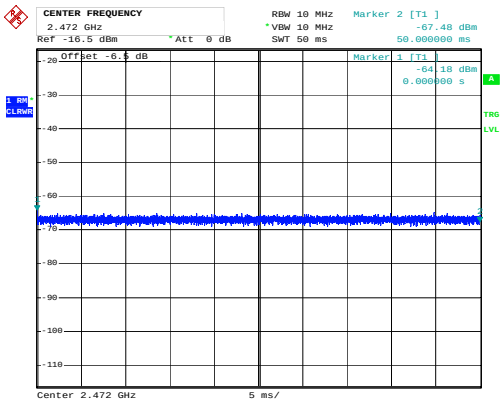

### 11g - F1 - Short Control Signalling Transmissions




### 11g - F3 - Channel Occupancy Time/ Idle Period



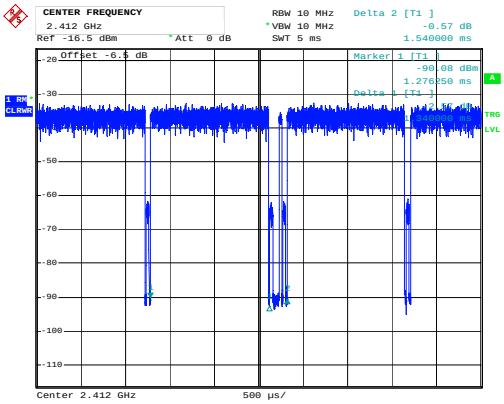

### 11g – F3 - Short Control Signalling Transmissions



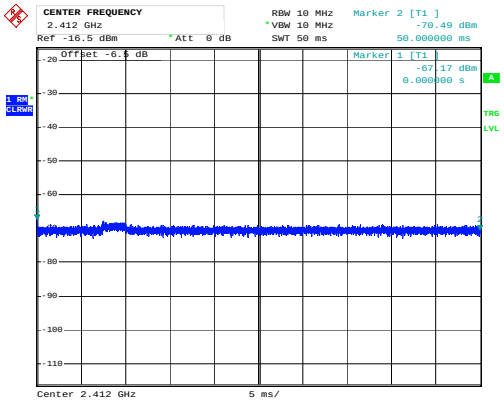

Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

## Adaptivity Result Time Plots

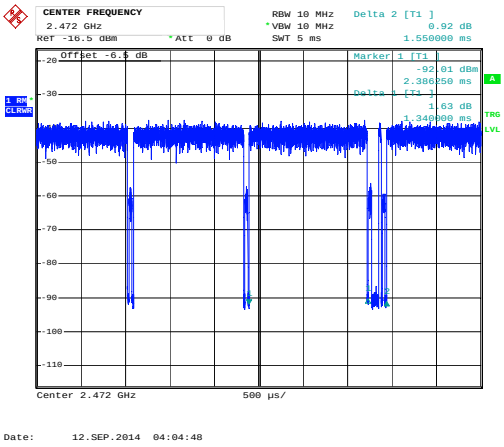
### HT20 - F1 - Channel Occupancy Time/ Idle Period



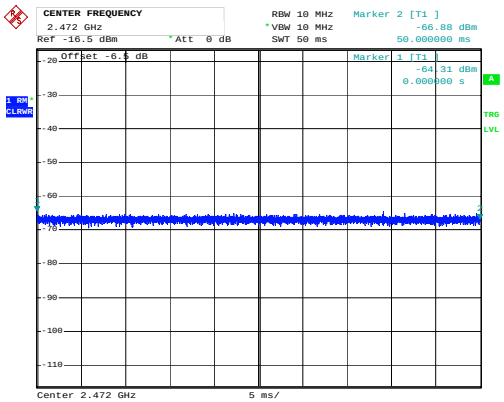

### HT20 - F1 - Short Control Signalling Transmissions




### HT20 - F3 - Channel Occupancy Time/ Idle Period



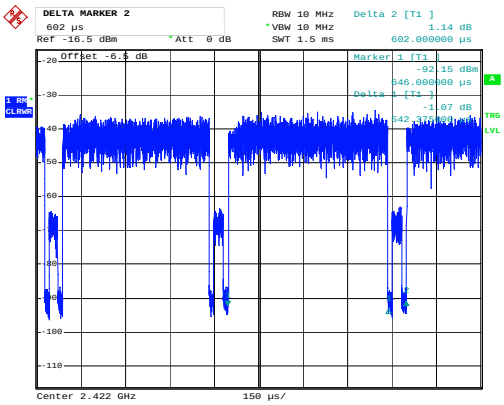

### HT20 – F3 - Short Control Signalling Transmissions




Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

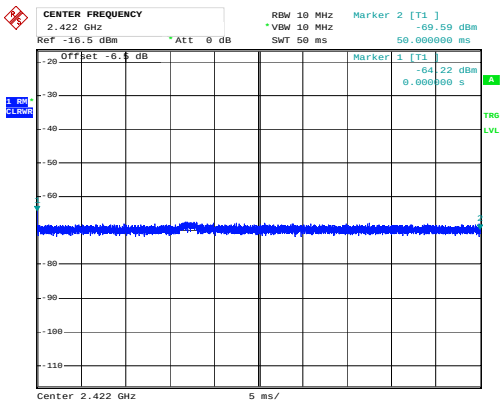
## Adaptivity Result Time Plots

### HT40 - F1 - Channel Occupancy Time/ Idle Period



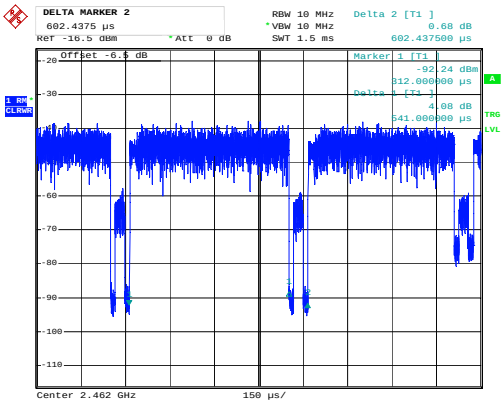

Date: 12.SEP.2014 03:52:20

### HT40 - F1 - Short Control Signalling Transmissions



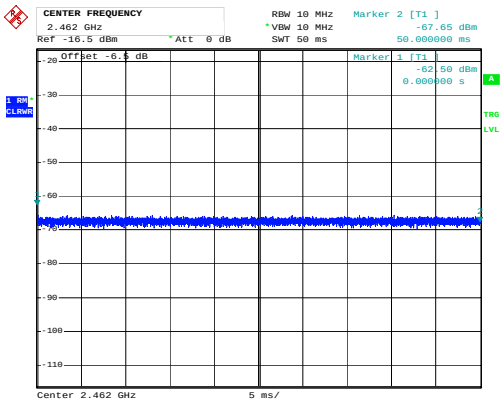

Date: 12.SEP.2014 03:53:54

### HT40 - F3 - Channel Occupancy Time/ Idle Period




Date: 12.SEP.2014 03:59:10

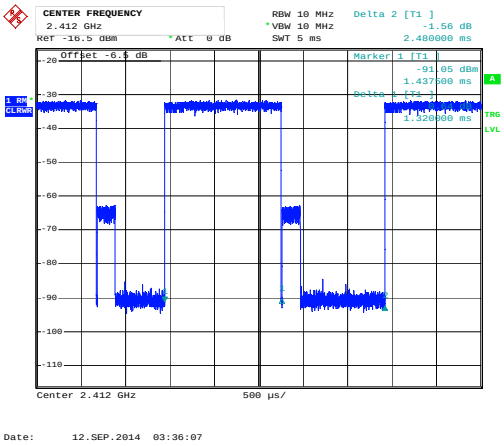
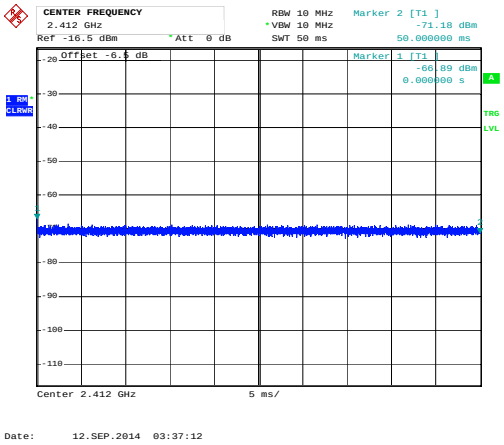
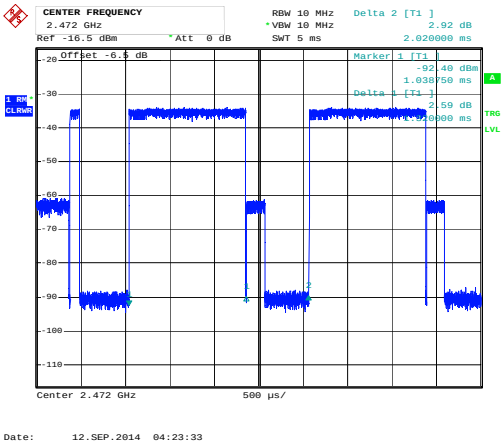
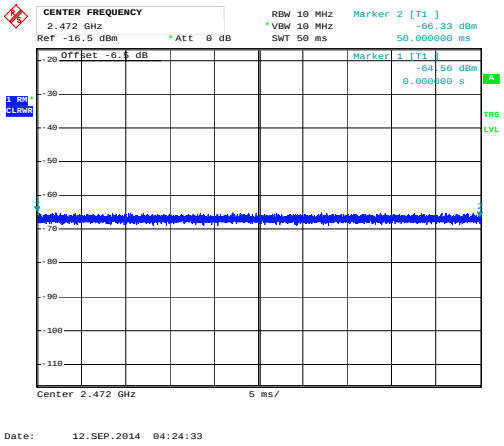
### HT40 – F3 - Short Control Signalling Transmissions




Date: 12.SEP.2014 04:00:29

Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

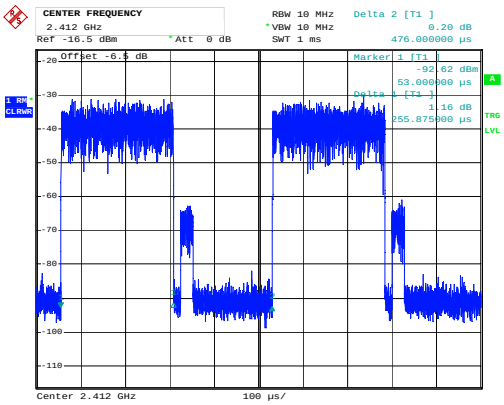
## 5.1.7 Test Result of Receiver Blocking Time Plots

| Receiver Blocking Result Time Plots | |
|---|---|
| **11b - F1 - Channel Occupancy Time/ Idle Period** | **11b - F1 - Short Control Signalling Transmissions** |
|  |  |
| **11b - F3 - Channel Occupancy Time/ Idle Period** | **11b – F3 - Short Control Signalling Transmissions** |
|  |  |

Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

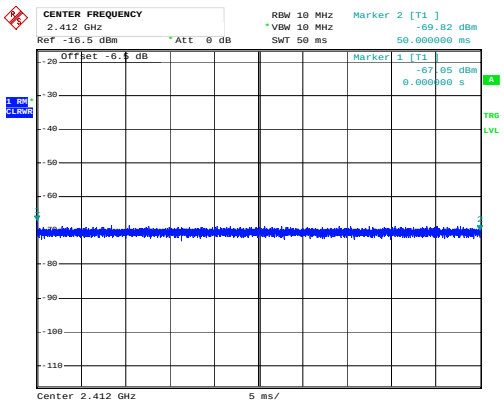
## Receiver Blocking Result Time Plots

### 11g - F1 - Channel Occupancy Time/ Idle Period



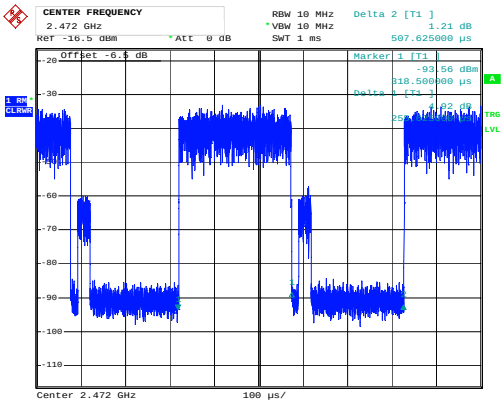

Date: 12.SEP.2014 03:42:21

### 11g - F1 - Short Control Signalling Transmissions



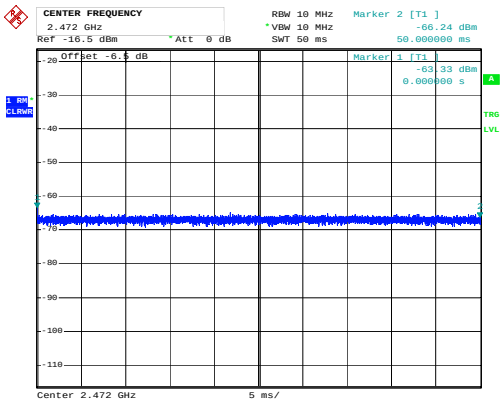

Date: 12.SEP.2014 03:43:24

### 11g - F3 - Channel Occupancy Time/ Idle Period




Date: 12.SEP.2014 04:12:39

### 11g – F3 - Short Control Signalling Transmissions

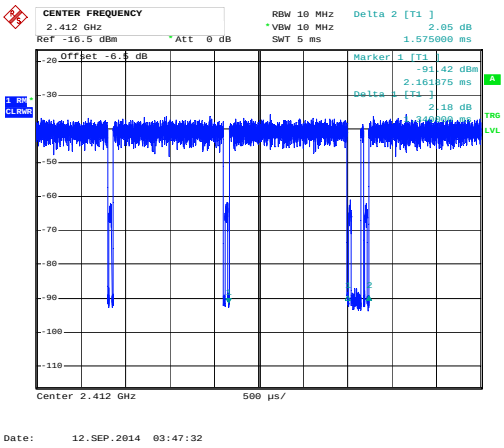



Date: 12.SEP.2014 04:13:41

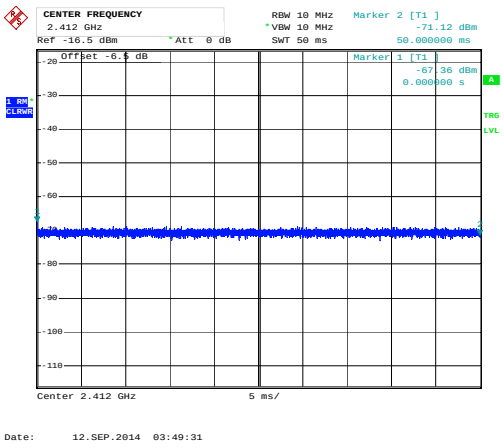
Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

## Receiver Blocking Result Time Plots

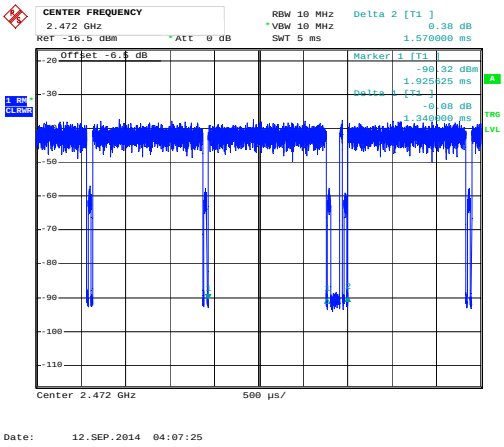
### HT20 - F1 - Channel Occupancy Time/ Idle Period



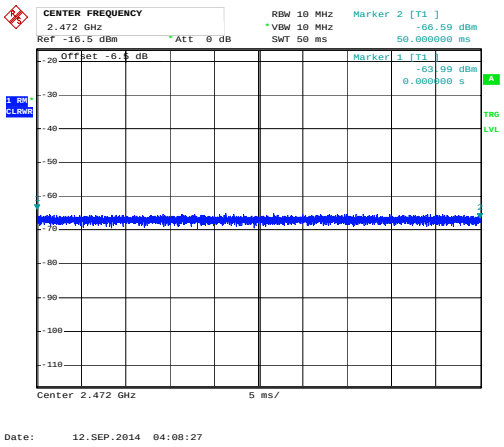

### HT20 - F1 - Short Control Signalling Transmissions




### HT20 - F3 - Channel Occupancy Time/ Idle Period



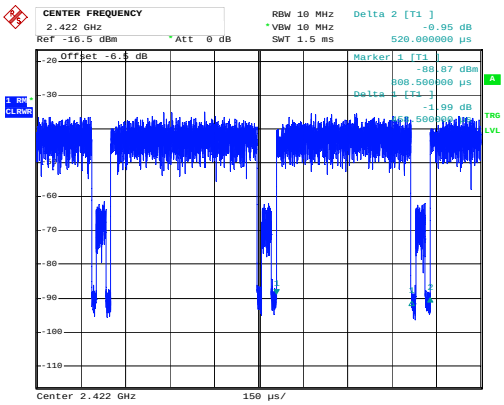

### HT20 – F3 - Short Control Signalling Transmissions



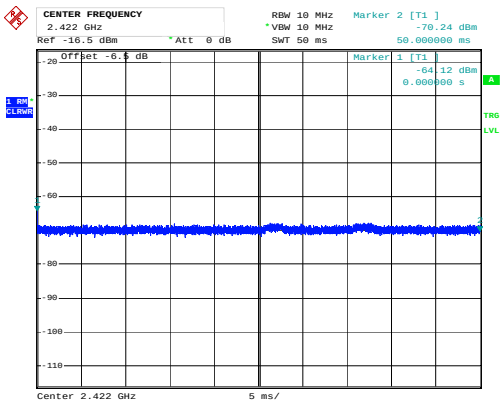

Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

## Receiver Blocking Result Time Plots

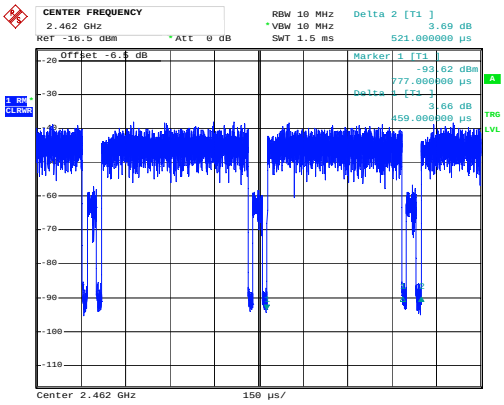
### HT40 - F1 - Channel Occupancy Time/ Idle Period



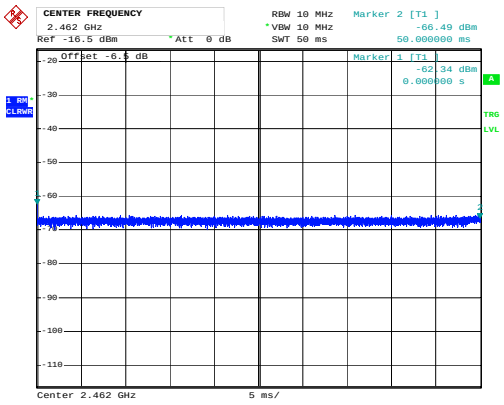

### HT40 - F1 - Short Control Signalling Transmissions




### HT40 - F3 - Channel Occupancy Time/ Idle Period




### HT40 – F3 - Short Control Signalling Transmissions




Note : In the plots of Short Control Signalling Transmissions, inject the interference signal to the EUT at the beginning.

# 6 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV 40 | 101013 | 9KHz~40GHz | Jan. 25, 2014 | RF Conducted |
| Temp. and Humidity Chamber | Giant Force | GTH-225-20-SP-SD | MAA1112-007 | -20 ~ 100℃ | Nov. 20, 2013 | RF Conducted |
| Signal Generator | R&S | SMR40 | 100116 | 10MHz ~ 40GHz | Jul. 31, 2014 | RF Conducted |
| Power Sensor | Anritsu | MA2411B | 0917017 | 300MHz ~ 40GHz | Jan. 28, 2014 | RF Conducted |
| Power Meter | Anritsu | ML2495A | 0949003 | 300MHz ~ 40GHz | Jan. 28, 2014 | RF Conducted |
| RF Cable-0.2m | HUBER+SUHNER | SUCOFLEX_103 | 10712/4 10709/4 | 30MHz ~ 26.5GHz | Dec. 02, 2013 | RF Conducted |
| RF Cable-1m | HUBER+SUHNER | SUCOFLEX_104 | SN 324557 | 30MHz ~ 26.5GHz | Dec. 02, 2013 | RF Conducted |
| RF Cable-2m | HUBER+SUHNER | SUCOFLEX_104 | 345675/4 345673/4 | 30MHz ~ 26.5GHz | Dec. 02, 2013 | RF Conducted |
| RF Power Splitter | Worken | 0120A02056002D | N/A | 2 Way | NA | RF Conducted |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV 40 | 101514 | 10Hz~40GHz | Jun. 13, 2014 | Radiated Emission |
| Amplifier | Agilent | 8447D | 2944A11146 | 10kHz ~ 1.3GHz | Jul. 15 , 2014 | Radiated Emission |
| Amplifier | Agilent | 8449B | 3008A02096 | 1GHz ~ 26.5GHz | Mar. 27, 2014 | Radiated Emission |
| Bilog Antenna | SCHAFFNER | CBL6111C | 2737 | 25MHz ~ 2GHz | Oct. 19, 2013 | Radiated Emission |
| Horn Antenna | COM-POWER | AH-118 | 10091 | 1GHz ~ 18GHz | Jan. 28, 2014 | Radiated Emission |
| Horn Antenna | ETS | 3115 | 6744 | 1GHz ~ 18GHz | May 05, 2014 | Radiated Emission |
| RF Cable-R03m | Jye Bao | RG142 | CB031 | 30MHz ~ 1GHz | Dec. 01, 2013 | Radiated Emission |
| RF Cable-10m | HUBER+SUHNER | SUCOFLEX_104 | SN 345675/4 | 1GHz ~ 26.5GHz | Dec. 01, 2013 | Radiated Emission |
| Turn Table | Chaintek Instruments | 3000 | MF780208275 | 0 ~ 360 degree | N/A | Radiated Emission |
| Antenna Mast | HD | 100 | HD1000203311 | 1 ~ 4 m | N/A | Radiated Emission |

Note: Calibration Interval of instruments listed above is one year.

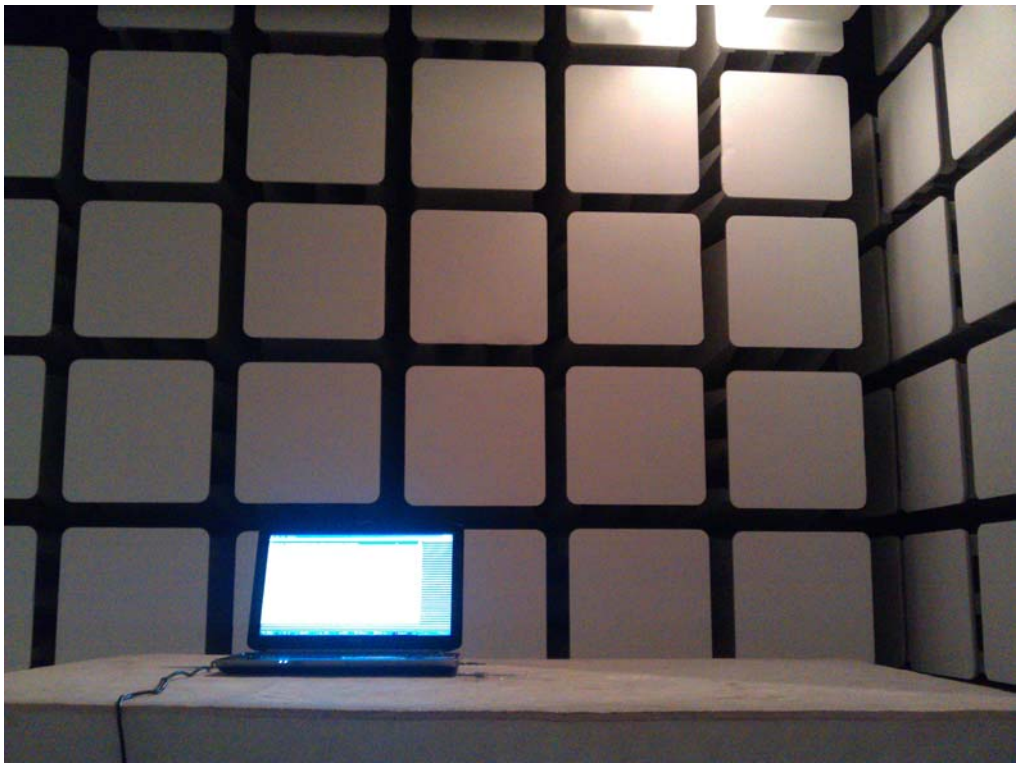
| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSP7 | 100645 | 9kHz ~ 7GHz | Apr. 17, 2014 | Adaptivity |
| Vector Signal Generator | R&S | SMU200A | 102098 | 100kHz ~ 6GHz | Oct. 03, 2013 | Adaptivity |
| Horn Antenna | COM-POWER | AH-118 | 711064 | 1GHz ~ 18GHz | Sep. 17, 2013 | Adaptivity |
| Horn Antenna | COM-POWER | AH-118 | 10094 | 1GHz ~ 18GHz | Apr. 21, 2014 | Adaptivity |
| RF Cable-3m | HUBER+SUHNER | SUCOFLEX_104 | 302338 | 1GHz ~ 26.5GHz | Dec. 03, 2013 | Adaptivity |
| RF Cable-8m | HUBER+SUHNER | SUCOFLEX_104 | MY17172/4 | 0.05GHz ~ 26.5GHz | Dec. 03, 2013 | Adaptivity |
| RF Cable-0.5m | HUBER+SUHNER | SUCOFLEX_103 | 53804/3 52134 | 1GHz ~ 33GHz | Dec. 03, 2013 | Adaptivity |
| RF Power Divider | Worken | 0120A002201801O | 11012007220 | 2 Way | Dec. 03, 2013 | Adaptivity |

Note: Calibration Interval of instruments listed above is one year.

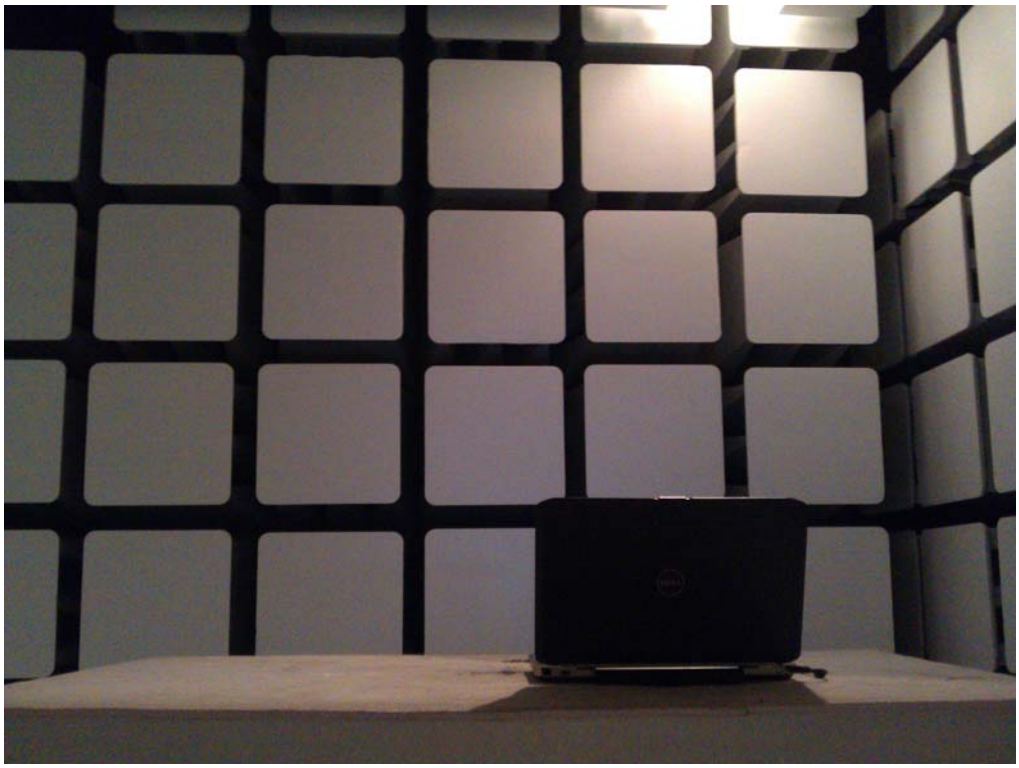
# Appendix A. Test Photos

# 1 Photographs of Radiated Emissions Test Configuration

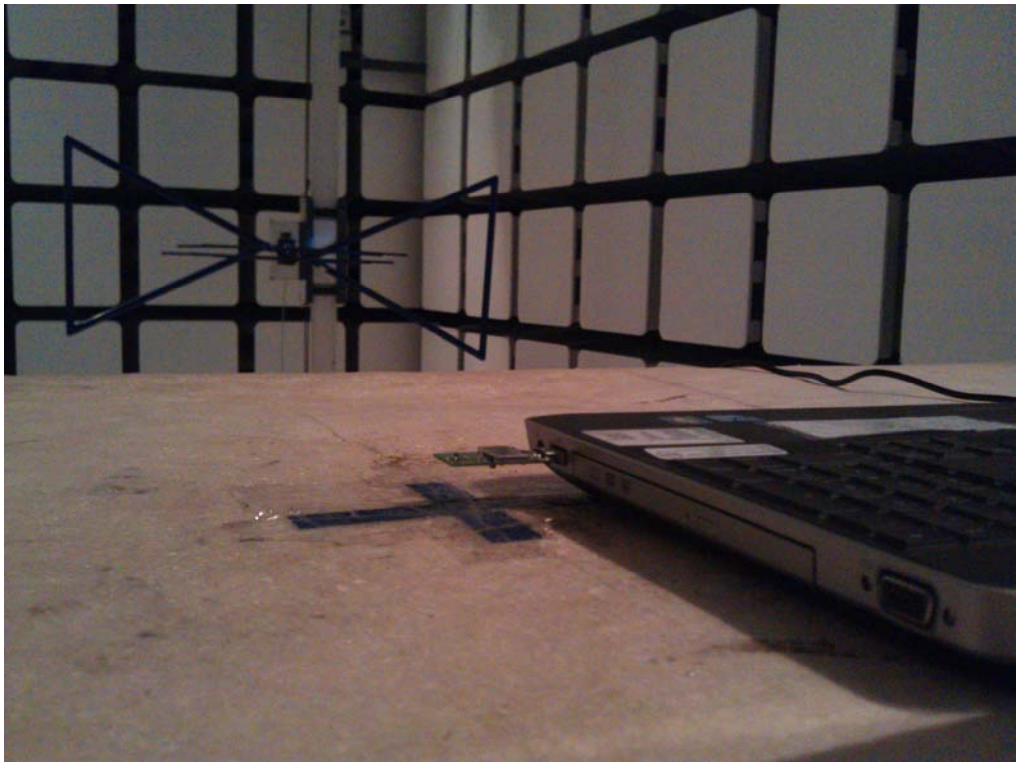
**Front View**



**Rear View**

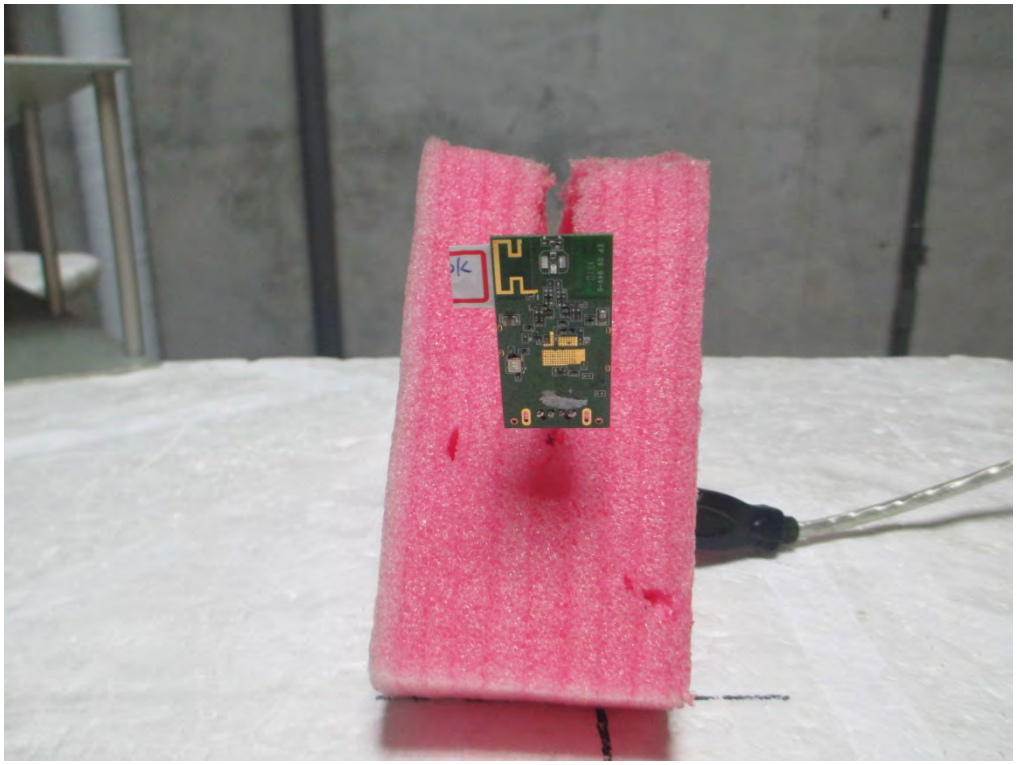


**Below 1GHz**

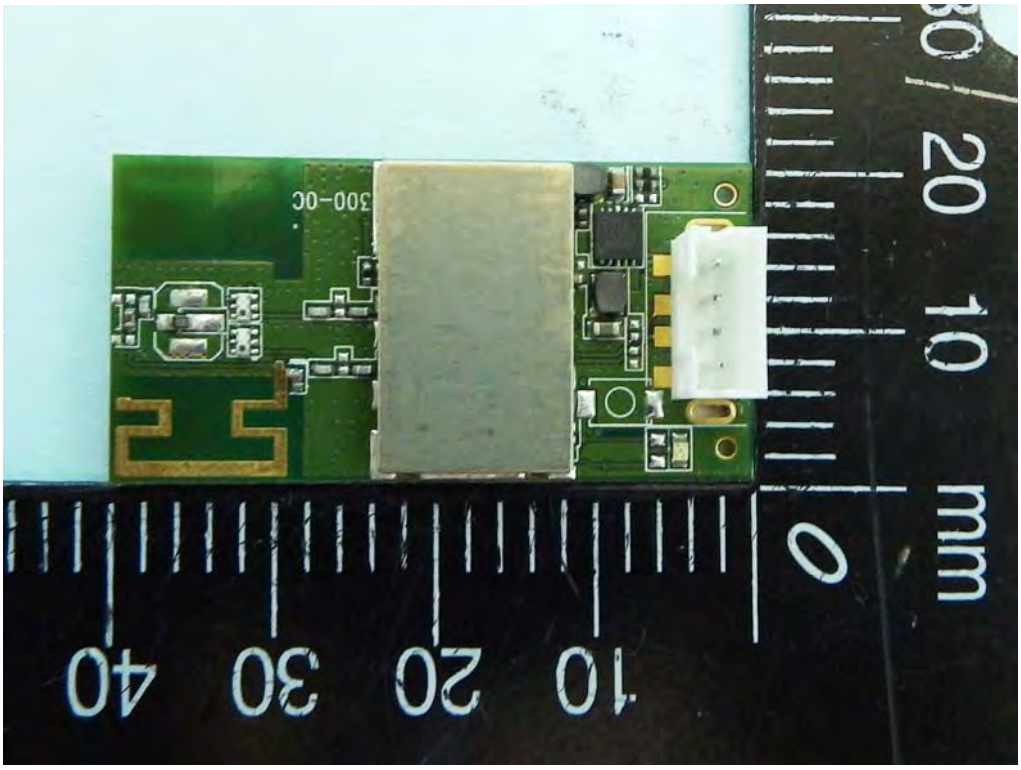


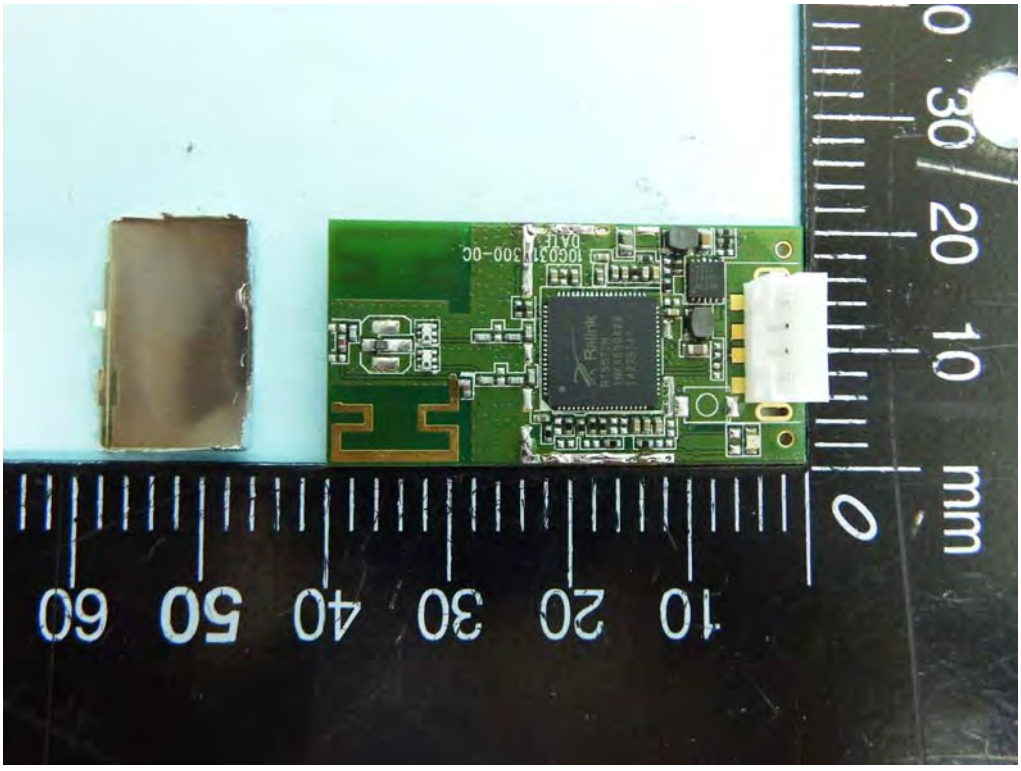
**Above 1GHz**

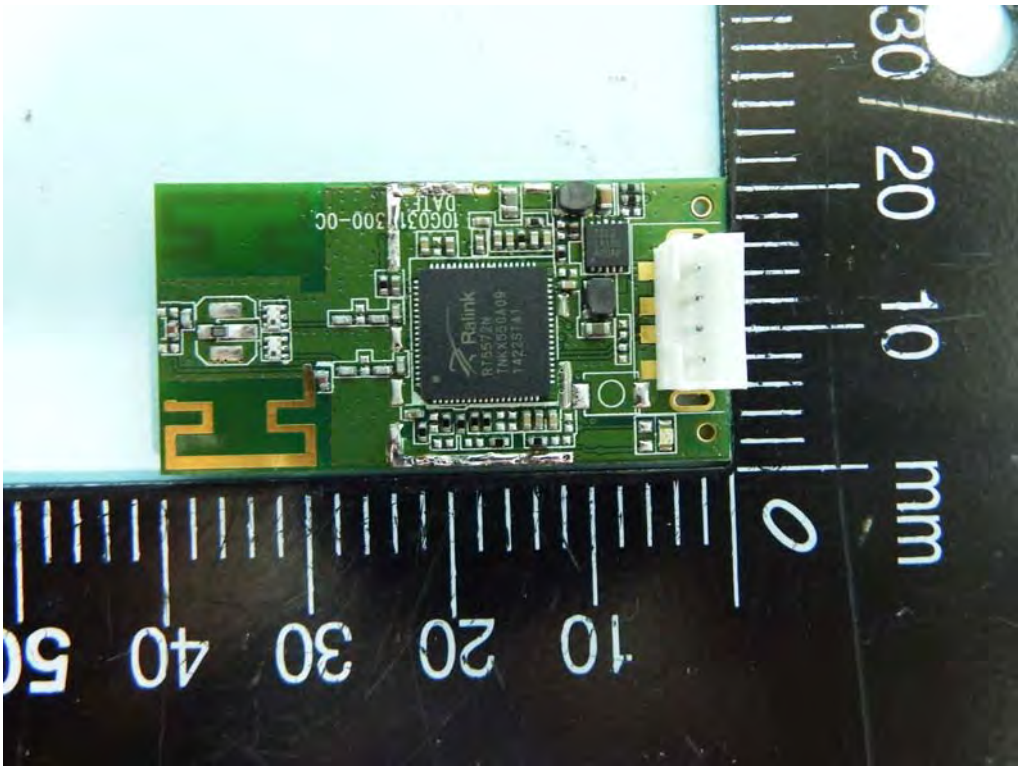
# 2 Photographs of Adaptivity Test Configuration

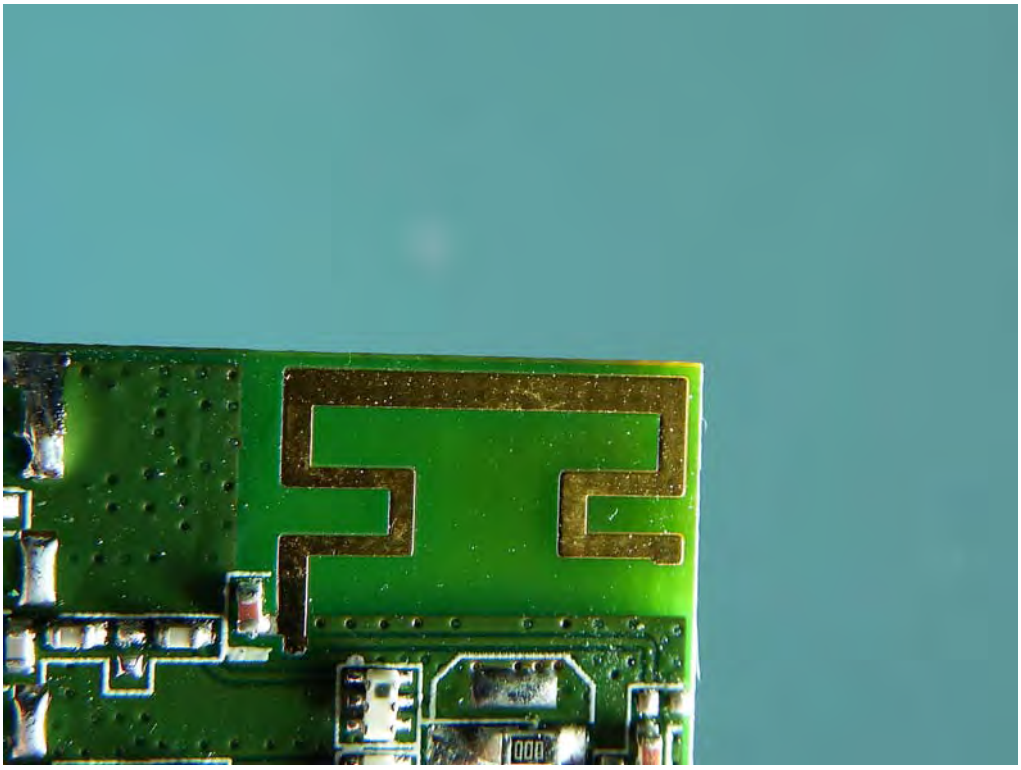


# APPENDIX B. Photographs of EUT

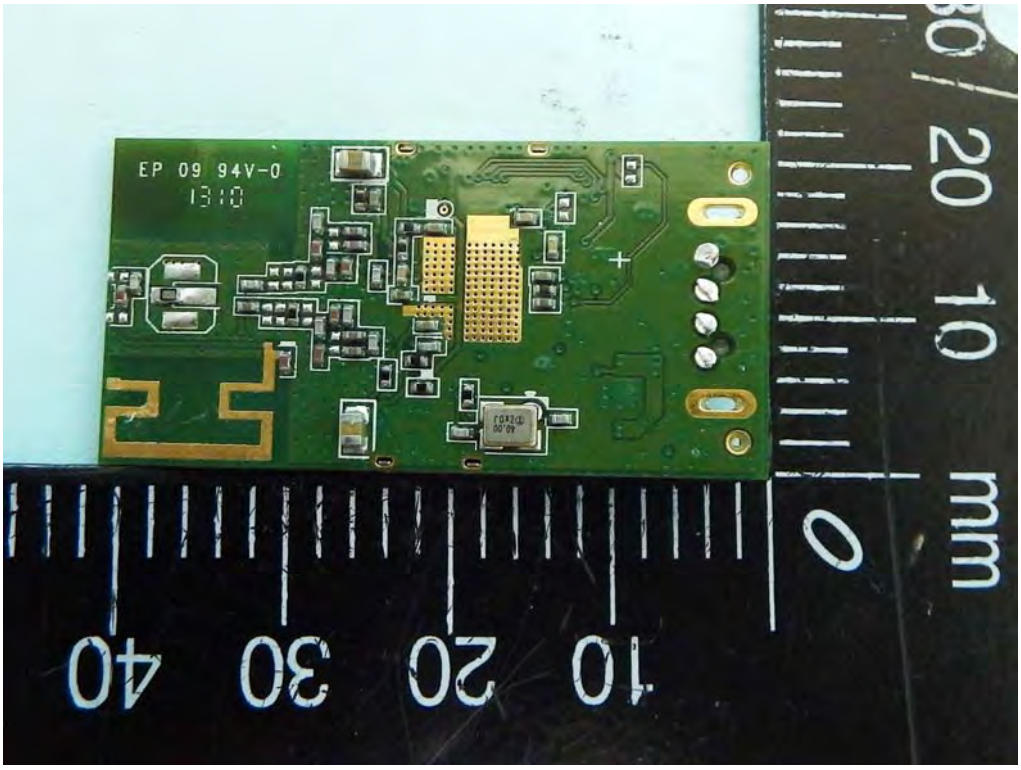


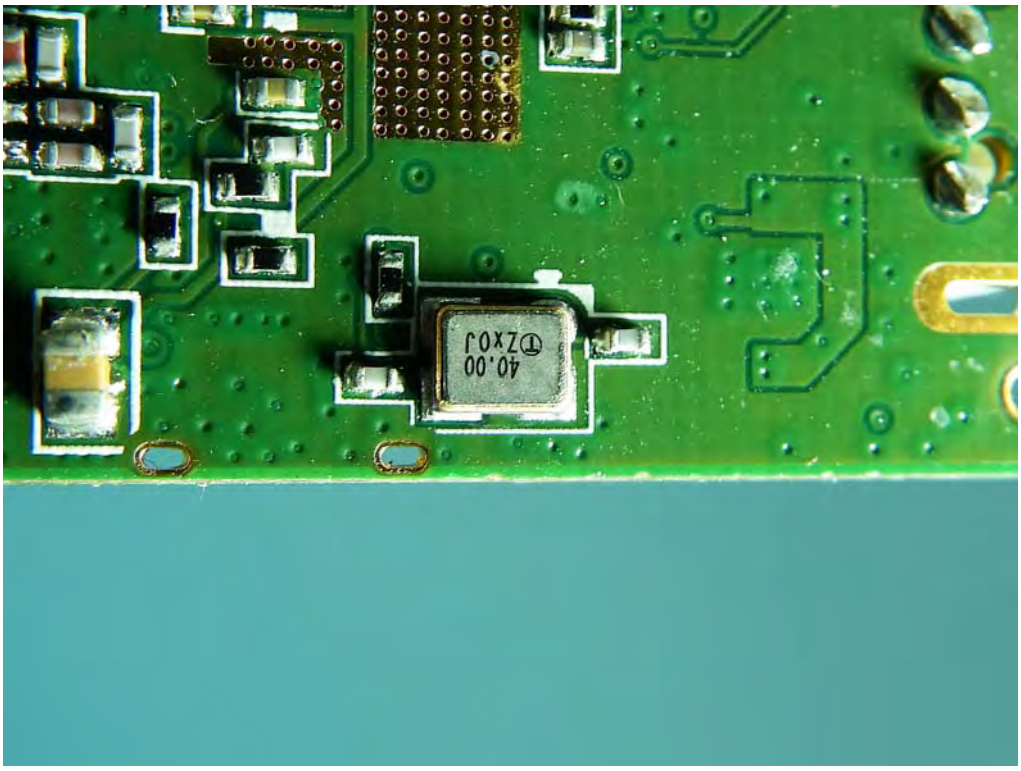



Ralink
30
20
10
0
mm
10
20
30
40
50




Ralink
RT5572N
TNKX530A09
1422ST41


EP 09 94V-0
mm
0
10
20
10
20
30
40


40.00